

RESPONSE ALTERNATIVES EVALUATION REPORT

**OLIN CHEMICAL SUPERFUND SITE
51 EAMES STREET
WILMINGTON, MASSACHUSETTS**

Submitted to:

**United States Environmental Protection Agency
Office of Site Remediation and Restoration
5 Post Office Square, Suite 100
Boston, Massachusetts 02109-3912**

Submitted by:



**Olin Corporation
3855 North Ocoee Street, Suite 200
Cleveland, Tennessee 37312**

Prepared by:



**AMEC Environment & Infrastructure, Inc.
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Wakefield, Massachusetts 01880**

August 3, 2012

AMEC Project Number 6107120016.01.15

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A handwritten signature in black ink, appearing to read "Peter H. Thompson".

Peter H. Thompson
Project Manager

A handwritten signature in black ink, appearing to read "Michael J. Murphy".

Michael J. Murphy
Principal Scientist

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GLOSSARY OF ACRONYMS

Al	Aluminum
AMEC	AMEC Environment & Infrastructure, Inc.
BEHP	Bis-2-ethylhexylphthalate
Ca	Calcium
Cl	Chloride
Cr	Chromium
DAPL	Dense Aqueous Phase Liquid
DOW	Dow Chemical Company
DWG	Drinking Water Guideline
Fe	Iron
gpm	Gallon per Minute
MassDEP	Massachusetts Department of Environmental Protection
MCL	Maximum Contaminant Level
MCP	Massachusetts Contingency Plan
Mn	Manganese
MSL	Mean Sea Level
MWRA	Massachusetts Water Resources Authority
Na	Sodium
ng/L	Nanograms per Liter
NH3	Ammonia
NH4+	Ammionium Ion
nm	Nanometers
NPL	National Priorities List
NDMA	N-nitrosodimethylamine
NDPA	N-nitrosodiphenylamine
O&M	Operation and Maintenance
OU	Operable Unit
PAH	Polynuclear Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyls
RAE	Response Alternatives Evaluation
RAO	Removal Action Objective
RI/FS	Remedial Investigation/Feasibility Study
SO4	Sulfate
SVOC	Semi-volatile Organic Compounds

Olin Corporation
Olin Chemical Superfund Site – Wilmington, MA
Response Alternatives Evaluation Report

USEPA United States Environmental Protection Agency
UV Ultraviolet
UVT Ultraviolet Transmission

VOC Volatile Organic Compounds

1.0 INTRODUCTION

This Response Alternatives Evaluation (RAE) Report has been prepared on behalf of Olin Corporation (Olin) by AMEC Environment & Infrastructure, Inc. (AMEC) consistent with the work plan approved by the United States Environmental Protection Agency (USEPA) on December 7, 2011. The scope of this effort includes evaluating alternatives to treat or replace private well water supplies impacted by constituents associated with the Olin Chemical Superfund Site (Site). The alternatives are based on the list of technologies presented in a technologies screening memorandum approved by USEPA on February 17, 2012.

The scope of the report includes presentation of site characterization information (Section 2), identification of removal action objectives (Section 3), identification of and analysis of response action alternatives (Section 4), and a comparative analysis of alternatives (Section 5) followed by a summary and conclusions (Section 6).

2.0 SITE CHARACTERIZATION

This section provides a general summary of site background information that is relevant to the potential presence of site-related constituents in residential water supply wells that are the focus of this evaluation. This section also discusses historical residential well water supply sampling efforts. For detailed description of Site history, remedial investigations and removal actions conducted under the Massachusetts Contingency Plan (MCP) the reader is referred to The Preliminary Remedial Investigation Report (MACTEC, 2007) and the Remedial Investigation and Feasibility Study (RI/FS) Work Plan.

2.1 Site Description and Background

The Site includes the approximate 50-acre Olin Property (the Property) and adjacent off-Property areas where environmental impacts associated with past manufacturing and waste disposal activities at the Property have been detected. The Property is located in an industrialized area within the southern portion of the Town of Wilmington and is the location of a former manufacturing facility that produced specialty chemicals for the rubber and plastics industry from 1953 to 1986. From 1953 to 1980 the facility was owned by several non-Olin companies whose operations resulted in environmental contamination to on-Property soil, groundwater, sediment, and surface water.

Process waters and liquid wastes were discharged to unlined excavations in the native soil and percolated into the soil or overflowed into on-Property ditches until the early 1970's when a treatment plant was installed. The liquid wastes contained dissolved inorganic constituents. The densities of some of these fluids were greater than that of water, and penetrated the water table. These dense fluids, herein referred to as Dense Aqueous Phase Liquids (DAPL) migrated downward to the bedrock surface, and pooled in bedrock depressions. The DAPL material migrated to the west and northwest within a sloping bedrock valley (the Western Bedrock Valley) and remains in isolated pools in bedrock depressions located both on- and off-Property. Some of the inorganic constituents that the DAPL is comprised of have diffused out of the DAPL into surrounding groundwater resulting in a diffuse groundwater plume.

The primary constituents associated with these chemical releases include inorganic compounds, although specific volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) were also associated with chemical processes used at the Property. The DAPL is characterized by low pH, high concentrations of total dissolved solids, and its principal constituents include sodium (Na), calcium (Ca), chloride (Cl), iron (Fe), manganese (Mn), sulfate (SO₄), ammonia (NH₃) or ammonium ion (NH₄⁺), aluminum (Al), and chromium (Cr). The DAPL and groundwater that immediately overlies DAPL also contain low level concentrations of VOCs and SVOCs. VOCs that are most commonly detected include acetone, bromoform, 2-butanone, 2-hexanone, toluene and trimethylpentenes. Detected SVOCs most commonly include benzoic acid, bis-2-ethylhexylphthalate (BEHP), phenols, naphthalene, n-nitrosodiphenylamine (NDPA), and n-nitrosodimethylamine (NDMA).

Investigations to date indicate the presence of site-related constituents in fractured bedrock in downgradient areas. Borehole geophysical data collected in 2010 in bedrock boreholes indicated several primary fracture orientations that were consistently present in most bedrock boreholes across the Site. Consistent with the regional geology, the dominant fracture orientation (strike direction) is northeasterly, and with fracture dips (inclined direction of a fracture plane) to the northwest and southeast at moderate to steep angles. Smaller subsets of fractures are oriented toward the north and west, with dips in opposing directions (east-west, and north-south, respectively). Collectively, these fracture patterns provide a network of interconnected fractures that allows the movement of groundwater in bedrock to occur in response to both natural gradients and gradients induced locally by pumping where groundwater is extracted to provide private water supplies. In areas adjacent to topographic highs that are supported by bedrock, the bedrock tends to be very competent and hard (resistant to erosion) and more sparsely fractured, and subsequently less transmissive.

Olin actively and voluntarily identified private residences with private water wells adjacent to the site where a potential for environmental impact existed and tested water from these wells on an annual basis over a period of years beginning in 1990.

The on-going private well monitoring program (October 2008 to October 2011), includes eleven properties where private wells have been sampled on a quarterly basis. Samples from these eleven private wells have been analyzed for VOCs, SVOCs, metals, inorganics and NDMA. In March 2011, an additional property was added. In October 2011, seven additional private wells were sampled and analyzed for NDMA only. The current monitoring program was developed in consultation with USEPA and includes NDMA/NDPA, SVOCs, chromium, sodium, nitrite/nitrate, chloride, sulfate and ammonia. Hexavalent chromium is included where either chromium or NDMA has been detected.

The current monitoring program was derived from the results of historical private-well monitoring conducted over several periods from the early 1990s to 2005 and which included a comprehensive list of analytes including VOCs, SVOCs, pesticides, polychlorinated biphenyls (PCBs), metals, inorganics, acetaldehyde, formaldehyde, hydrazine, Opex and Kempre. Low level analysis of NDMA, comparable to the method used currently, was conducted in 2003, 2004 and 2005. In September 2005, USEPA proposed that the Site be listed on the National Priorities List (NPL). The site scoring that lead to the proposed listing was primarily based on the compound NDMA (USEPA, 2005). The primary exposure pathway evaluated by USEPA was groundwater. Other principal contaminants noted included chloride, sodium, sulfate and ammonia.

2.2 Nature of Impacts to Private Water Supply Wells

Based on the results of the current monitoring program the USEPA identified a southern area and a northwestern area to consider as part of this evaluation. These areas are reproduced from the RAE Work Plan as shown in Figure 1. Residential properties M-24/L-54, M-24/L-63, M-24/L-64, M-24/L-72A, and M-24/L-94 are located in the southern area and NDMA has been detected

in at least one groundwater sample from the private well at each of those properties. Residential properties M-02/L-07E, M-15/L-02C, and M-27/L-14C are located in the northwestern area and NDMA has been detected in at least one groundwater sample collected from the private well at each of those properties. It should be noted that NDMA has never been detected in any of these wells at concentrations that would be associated with risk above the upper end of the USEPA's published acceptable excess lifetime cancer risk range.

The USEPA has not identified a maximum contaminant level (MCL) for NDMA in drinking water. However, a Drinking Water Guideline (DWG) from the Massachusetts Department of Environmental Protection (MassDEP) has been developed at 10 nanograms per liter (ng/L). Please refer to Table 2-1 for a range of detected analytes from the eight properties at the Site, listed above, where NDMA has been detected. Please refer to Table 2-2 for a summary of private well data for NDMA and a classification of the sample source as either potable or irrigation water. This table presents a data summary for data collected to date during the RI/FS Program. Appendix A tabulates all residential data collected since October 2008.

The USEPA and Olin have agreed that Olin will continue to gather data as part of the existing and future residential well sampling program and will evaluate risk associated with that data as it is generated. Although sodium has not been detected at concentrations of human health concern sodium has been detected at concentrations greater than 20 mg/L and such detections have been highlighted for persons on salt-restricted diets. Table 2-1 presents a comparison between reported concentrations for all analytes and respective screening levels. Only NDMA warrants evaluation for treatment. The range of concentrations of other detected compounds is presented in Table 2-1 consistent with the RAE Work Plan.

Several SVOCs including phthalates and polycyclic aromatic hydrocarbons (PAHs) have been reported in some water samples but have been identified as artifacts of laboratory analysis based on review of laboratory quality control data during validation and are not constituents reliably detected in groundwater. This includes constituents such as BEHP, which is a recognized site-related constituent, but one that has limited potential for migration in groundwater. BEHP was detected at a concentration above its MCL once but subsequent re-sampling of that location (M-02/L-07E) was below the MCL. Therefore, no SVOC has been identified that warrants evaluation in this RAE.

This RAE will not evaluate treatment technologies for naturally-occurring substances detected at concentrations consistent with local groundwater that is un-impacted by the Site. Some treatment technologies may require pre-treatment to remove naturally occurring substances (such as hardness) to improve treatment system operation and maintenance. The focus of the RAE is to treat Site-related constituent(s) only.

Chromium is another constituent present at the Site that can occur naturally but is infrequently detected in residential water samples. Chromium has not been detected consistently at any residential location and has not been detected above the MCL. Hexavalent chromium was reported once at one residential well water sample location, but it is not clear whether this trace

concentration represents a false positive analytical result or very infrequent presence of this constituent.

Concentrations of other constituents (sodium, and chloride) that are constituents of DAPL but are also naturally occurring, or introduced from anthropogenic sources (i.e., in the form of de-icing road salt) were also reviewed. The range of concentrations of these constituents in wells where NDMA was also present are within the range of other nearby wells where NDMA has not been detected. For example the highest sodium concentration (76 mg/L) detected in the residential wells monitored was detected in the residential water sample from M-24/L87A which is located on Border Avenue. NDMA has not been detected at this location. This location also has consistently elevated chloride indicating potential road salt contamination. Chloride was below its secondary MCL of 250 mg/L in all residential samples. Therefore it cannot be concluded that the presence of these constituents in private water supply samples at the concentrations detected is Site related.

2.3 Private Water Supply Well Analytical Data

Appendix A contains private water supply well analytical data from 2008 through 2011. During this time period groundwater samples were collected from 19 different properties with private wells. As described in Section 2.1, eleven private water supply wells have been sampled on a quarterly basis from 2008 to 2011, one private water supply well has been sampled quarterly beginning in March 2011, and seven additional private water supply wells were sampled in October 2011.

2.4 NDMA as an Emerging Contaminant

USEPA's NDMA Fact Sheet (USEPA, 2008) identifies NDMA as an "emerging contaminant". Emerging contaminants are not currently listed under the Safe Drinking Water Act and are also called "contaminants of emerging concern" by the USEPA. It should also be noted that emerging contaminants are also frequently the subject of innovative treatment technology research. While some innovative treatment technologies may not be fully developed at the time this RAE was prepared, continued research and development may result in future treatment technologies that are both effective and cost efficient.

The physical and chemical properties of NDMA largely determine its mobility, environmental fate and transport and the degree to which treatment technologies are effective or potentially effective at reducing its concentration in groundwater. NDMA is a relatively low molecular weight, polar, highly soluble compound that is miscible in water. NDMA has a low Henry's Law constant, which means that it does not readily transfer from water to air. It does not substantially adsorb to organic carbon. It is not readily or directly metabolized by bacterial species commonly found in groundwater although some metabolic pathways have been shown to exist. The USEPA's NDMA Fact Sheet provides the following table with properties of NDMA:

Physical and Chemical Properties of N-Nitrosodimethylamine

CAS Number	62-75-9
Physical Description (physical state at room temperature)	Yellow liquid with no distinct odor
Molecular weight (g/mol)	74.08
Water solubility (g/L at 25 °C)	Miscible
Boiling point (°C)	154
Specific gravity (g/mL)	1.0059
Vapor pressure at 25 °C (mm Hg)	2.7
Log organic carbon partition coefficient ($\log K_{oc}$)	1.079
Log octanol-water partition coefficient ($\log K_{ow}$)	-0.57
Henry's Law Constant (atm m^3/mol)	2.63×10^{-7}

Source: Emerging Contaminant - Nitroso-dimethylamine (NDMA) Fact Sheet (USEPA, April 2008)

Notes: g = grams

mol = mole

L = liter

mL = milliliter

° C = degrees Celsius

mm Hg = millimeters of mercury

atm = atmosphere

m^3 = cubic meter

3.0 IDENTIFICATION OF REMOVAL ACTION OBJECTIVES

Since NDMA is the only identified contaminant of concern the general removal action objective (RAO) for this RAE is as follows:

For the protection of potential human receptors, prevent exposure to NDMA from direct ingestion to groundwater impacted NDMA at concentrations that exceed State or Federal drinking water standards (MMCLs or MCLs) or where no State or Federal drinking water standard has been established, prevent exposure from direct ingestion to concentrations of NDMA that exceed a carcinogenic risk of 1×10^{-4} and/or a non-carcinogenic target organ Hazard Index of 1.

This RAO includes identifying specific alternatives that could be used to provide safe drinking water. The RAO may be accomplished by providing an alternative source of potable water or by treatment of existing water supplies.

Other potential Site contaminants that would need to be considered for treatment for protection of human health or that might affect NDMA treatment are not indicated by current residential water supply analytical data. While residential water may exhibit concentrations of naturally occurring constituents that may affect efficiency and cost of operation and maintenance (O&M) of potential treatment approaches for NDMA, constituents at concentrations or water quality conditions that would preclude successful treatment are not present.

The following sections identify and evaluate response alternatives.

4.0 IDENTIFICATION AND ANALYSIS OF REMOVAL ACTION ALTERNATIVES

The term “removal action alternatives” in the context of this evaluation shall mean alternatives designed to provide safe potable water to residents that have been, or could be impacted by the detection of Site-related compounds consistent with the Approval Memorandum to perform an Engineering Evaluation /Cost Analysis (EPA, May 2011). The range of alternatives currently under consideration includes point of use treatment and options for providing an alternate source of potable water, as well as continued private well monitoring.

On February 6, 2012 AMEC submitted a Technical Memorandum for the Response Alternative Evaluation Technology Screening that included an exhaustive list of available treatment technologies for NDMA. The treatment technologies identified were suitable for the range of NDMA concentrations observed in the historic, holistic sampling of the Site. AMEC then screened these technologies and retained those technologies best suited to treat NDMA or provide an alternate source of potable water at the Site. It is a presumption of this analysis that residential water supply wells will continue to be monitored under the current OU3 program. On February 17, 2012, the USEPA approved, with comments, the Technical Memorandum and technology screening. Retained technologies are carried forward within this RAE. These technology evaluations incorporate USEPA comments.

In addition to the list of retained technologies, the USEPA requested that metal-catalyzed reduction of NDMA be reviewed. Laboratory research was reviewed as requested for palladium- and nickel-catalyzed reduction which has been demonstrated as effective for NDMA destruction [(Davie, et.al. 2006, 2008), (Friedrich et.al. 2008, 2009)]. The catalyst metals and nanoparticles used as part of treatment may be toxic (Friedrich et.al. 2009). Nickel catalysts are pyrophoric and present safety risks in handling (Friedrich et.al. 2009). While this technology shows promise, at this time metal-catalyzed reduction of NDMA is not sufficiently developed or ready for use in residential drinking water treatment. As such, AMEC has eliminated this technology from further consideration. Table 4-1 presents the screening of technologies, and has been updated to address USEPA comments.

Of several other adsorbents studied at the bench scale and retained in the Technology Screening memorandum, a resin manufactured under the name Ambersorb 572 was found to be the most effective in removing NDMA from water. These studies pertaining to this resin were conducted at concentrations higher than those detected in residential well groundwater samples. Ambersorb is no longer manufactured and was eliminated as a remedial alternative for point of use treatment.

Dow Chemical Company (DOW), the sole manufacturer of Ambersorb, recommended an alternative product, Optipor, but noted that no data regarding NDMA removal exists. Predictive models will be developed by DOW in the summer and fall of 2012 to determine the applicability of this alternative resin to NDMA. As the state of this alternate resin is still nascent and a treatment technology that has proven effective is needed, resin treatment has been screened

out. Delivery of potable water via tanker truck to a cistern has also been eliminated based on Town of Wilmington Board of Health concerns regarding permanence of this alternative.

The retained technologies are grouped into two general alternatives below. Alternative A is to provide an Alternative Potable Water Supply and Alternative B is to provide Point-of-use Treatment. Each of the retained technologies provides process options for each alternative (e.g., A, B1, and B2). The resultant removal action alternatives that will be carried through individual and comparative analysis are as follows:

Alternative A. Alternative Potable Water Supply

- A. Extension of municipal water supply lines.

Alternative B. Point-of-use Treatment

- B1. Point-of-use treatment by adsorption by coconut shell activated carbon.
- B2. Point-of-use treatment by ultraviolet (UV) irradiation.

The following sections review the effectiveness, implementability, and cost for each of these remedial action alternatives. The RAE Work Plan described these evaluation criteria and are reproduced below:

Effectiveness evaluations include a general discussion of both long term effectiveness and permanence, and short term effectiveness of each alternative separately. The long term effectiveness and permanence evaluation considers reliability of the measure. The short term effectiveness evaluation considers the alternatives protectiveness of public health and the community, workers and the environment and compliance with Applicable or Relevant and Appropriate Requirements (ARARs) identified in the approved RI/FS Work Plan. The assessment of effectiveness also considers ability of the technology to achieve the general RAOs based on level of treatment expected, and potential for residual effects, if any.

Implementability evaluations include discussion of the technical feasibility of each removal action alternative separately based on construction and operational considerations, demonstrated performance, if applicable, and the implementation timeframe. To the extent necessary, the implementability evaluation considers the availability of necessary equipment, requirements for outside laboratory testing to demonstrate performance, and administrative feasibility including, permits, easements or rights of ways required to implement the alternative.

Cost evaluations include capital costs based on unit prices and present worth costs of operation, maintenance and replacement of materials or capital equipment of each alternative. Capital costs for other point-of-use treatment are based on vendor estimates and engineering analysis. The detailed cost tables and present worth cost for each alternative are provided in Table 4-2 through 4-4.

Alternatives are evaluated below for these three evaluation criteria.

4.1 Alternative A: Extension of Municipal Water Supply Lines

The first alternative is the replacement of the drinking water supplies. This involves the extension of municipal water lines to the impacted residences. The extended water supply lines would then be connected to the residences in accordance with municipal codes and requirements.

The Town of Wilmington municipal water supply system utilizes water obtained from four groundwater wells and treated at either the E.H. Sargent Water treatment Plant or the Butters Row Water Treatment Plant in addition to a Massachusetts Water Resources Authority (MWRA) connection. The private well that is present at the impacted residential property would be formally disconnected from the residence to prohibit any future use of the water for potable purposes, and subsequently decommissioned. Decommissioning would be conducted in accordance with local/state regulations. Prohibition of potable use of the well would be documented as an environmental covenant in the property deed and registered with the registry of deeds.

The alternative would include design of the water line extension, development of specifications and bid documents, and a construction phase. A lift (pump) station to service residences was considered but ultimately eliminated for the southern area of the Site where elevated topography is present along Cook Avenue based on input from USEPA and the Town of Wilmington (see responses to USEPA comments). The water lines would be extended from existing water lines shown in Figure 2.

4.1.1 Effectiveness

The extension of municipal water lines is an effective remedial alternative. This alternative will permanently eliminate exposure to NDMA at concentrations that pose unacceptable long-term risk associated with ingestion of drinking water.

This alternative provides a high degree of long term effectiveness. Short term effectiveness will require engineering and construction controls to ensure safety of workers and public during construction of the water line extension.

The short term effectiveness of the extension of municipal water lines is considered to be high in that the safety controls to protect workers and public during construction are common.

As bedrock is shallow in the area of Cook Avenue, blasting of bedrock to install the water main and associated lines may be required. Safety practices can be readily implemented during construction to overcome safety risks associated with blasting. As soon as the municipal water lines are in place and servicing local residents, the RAO as defined in Section 3.0 is achieved.

4.1.2 Implementability

As shown in Figure 4-2 municipal water distribution mains are present throughout the Northwest Area and a portion of the Southern Area. Providing a residential supply line from an existing water distribution main is easily implemented. Where municipal water distribution mains are not present, the extension of the municipal water line is readily implementable and technically feasible. Site conditions including shallow bedrock and the elevated topography at impacted residences present some challenges but will make engineering design and construction only moderately more complex. The properties on Cook Avenue are at an elevation of approximately 130 to 140 feet above mean sea level (msl). The Town of Wilmington stores potable water in three water tanks. The closest two water tanks are located on Eagle Road at an approximate elevation of 150 msl and on Mulberry Lane at approximately 170 feet above msl. The third storage tank is located off Andover Street on the eastern end of Wilmington. The elevation of this third storage tank is approximately 230 feet above msl. Based on the relative elevations of the town water tanks and residences, in addition to information from the town (GeoInsight, 2012), a lift station will not be needed and is not included in the costs estimate.

4.1.3 Cost

The cost of providing municipal water is dependent on the proximity of an existing water distribution main. Where extension of municipal water lines is not required the costs are relatively low, but where it is required the capital costs are relatively high. Either has only moderate O&M costs once installed. The estimate for the water main extension provides a unit cost (\$/foot) for pipe installed in bedrock or in overburden since the potential number of locations and thus quantities are unknown based on agreement between Olin and EPA during the dispute resolution process. Individual water supply hookups to residences from the street valve may vary depending on distance from the roadway. These capital and labors costs are included in the cost estimate on a per residence basis assuming an average distance of 50 feet from the roadway.

Once installed, the extended water supply lines should not require significant maintenance. The total present worth cost for this remedial action alternative including initial capital costs and long-term O&M costs calculated for 30 years is \$140,000. Please refer to Table 4-2 for detailed costs. Table 4-2 presents unit costs by prior agreement with USEPA. If an NTCRA were to be performed, detailed costs for specific water supply replacement scenarios would be developed.

4.2 Alternative B1: Point-of-use Treatment by Adsorption by Coconut Shell Activated Carbon

As described in Section 4.0, point-of-use treatment alternatives were also evaluated. The first of these alternatives is Alternative B1. Alternative B1 is the treatment of impacted groundwater by coconut shell activated carbon at the point-of-use. This alternative will add tanks/ cylinders of coconut carbon to treat impacted groundwater prior to use. Carbon is a substrate that may be

subject to biological fouling. A post-treatment UV disinfection system may be required as a preventative measure.

Coconut shell activated carbon has demonstrated some success in removing NDMA from the dissolved phase. Note that solid phase extraction of NDMA in low level analytical methods for drinking water (Method 521) is performed using coconut carbon.

The coconut shell activated carbon adsorbs NDMA and removes it from groundwater. As the NDMA molecules are removed from the dissolved phase, the NDMA concentrations are reduced. Activated carbon will over time reach capacity for accepting new NDMA molecules. As such, these materials will require periodic regeneration or replacement.

A series of coconut carbon filled media tanks/cylinders will be installed as part of this treatment system. Ports on the treatment system are sampled at the influent, between tanks, and outlet side of the system prior to the potable supply line. By monitoring the NDMA concentrations it is possible to determine when media has reached breakthrough capacity and is spent. Spent media will be replaced. With experience, the breakthrough time can be estimated through water use and an inline flow totalizing meter would aid in optimizing sampling frequency.

The treated potable water from the treatment system will be connected to the portion of the water supply used for household uses within the residence. The alternative would include design of the treatment system, development of specifications and bid documents, and a construction phase.

4.2.1 Effectiveness

The treatment of impacted groundwater with coconut carbon will need to be verified by bench testing to demonstrate effectiveness and for the purpose of this evaluation is considered to have less certainty than other alternatives based on literature. Therefore this alternative has been given a low to moderate rating for effectiveness. Coconut carbon, though better than granular activated carbon still has a relatively low adsorption capacity for NDMA. Therefore, the reductions of NDMA may or may not achieve RAOs, and will be dependent on system sizing and retention time.

Both the reliability and permanence of this alternative provide medium long-term effectiveness. The ability of the media to reduce NDMA concentrations to the RAO may be affected by variations in the NDMA influent concentrations. The permanence of the system is considered to be low as the media will require regular replacement. The system once installed will require ongoing monitoring.

This alternative provides medium short-term effectiveness. The construction of the treatment system presents low safety risks to workers or residents. The treatment system installation also does not present risk to the public or the environment. The achievement of RAOs is potentially low to medium and will depend how effectively adsorption works for low NDMA concentrations.

4.2.2 Implementability

The alternative is easily implemented. Tanks, piping, tank media, and disinfection systems are readily available. To install a system that achieves the RAO, would require bench-scale testing. This testing would determine the system size (i.e., number of tanks/cylinders, amount of media required, appropriate flow rates, and break through curve characteristics).

Once bench-scale testing was complete and system design complete, the full-scale residential system would be installed. The installed system would also require initial testing to verify that system was achieving the RAO for NDMA.

4.2.3 Cost

The installation of a point-of-use activated carbon treatment system alternative would include relatively low capital costs and moderate long-term costs. The capital costs would include: performing bench-scale and full-scale verification tests, tank installation, piping installation within residences, and purchase and installation of the disinfection system. Once installed, long-term costs will include the periodic monitoring and regular media replacements and maintenance of the disinfection system, as needed.

The total present worth cost for this remedial action alternative including initial capital costs and long-term O&M costs calculated for 30 years is \$140,000. Please refer to Table 4-3 for detailed costs.

4.3 Alternative B2: Point-of-use Treatment by UV Irradiation

The second point of use treatment alternative is Alternative B2, UV irradiation. As described in the technology screening memorandum, the destruction of NDMA through UV photolysis is the only well-demonstrated and most effective treatment technology available for NDMA. In reviewing UV treatment alternatives, UV treatment combined with chemical oxidation (UV oxidation) offers no advantage over UV irradiation for NDMA destruction. Although this technology is most commonly applied at the municipal or industrial scale, recent innovations should allow UV irradiation to be scaled down to a point-of-use treatment suitable for residential water supplies. Factors important to UV treatment are discussed below with a level of detail necessary to understand and evaluate scalability of the technology.

UV light energy in a specific wavelength (225-250 nanometers (nm)) is strongly absorbed by the NDMA molecule and results in cleaving the nitrogen-nitrogen bond in the molecule. This photolysis breaks down NDMA into less harmful degradation products including dimethylamine and nitrite which will not recombine to form the parent molecule. The light energy and wavelength required can be provided by a low pressure mercury bulb that will operate on 120-240 volt circuits. The destruction efficiency is a function of the amount of energy that is provided by the UV lamp and the time period of exposure for light absorbance. Efficiency of NDMA destruction by UV irradiation is also dependent upon the water UV transmission (UVT) characteristics of the water and the specific system design. Thus the efficiency of treatment may

be improved by increasing the amount of UV light energy used or by reducing the flow rate of the treatment system.

Based on discussions with manufacturer's technical representatives, a single commercially available system could potentially achieve 90% destruction efficiency at a one gallon per minute (gpm) flow rate. The reduction in NDMA concentrations will be inversely proportional to the flow. If the flow were reduced to 0.5 gpm then the reduction may approach 99%. Thus treatment efficiency may be improved by adding a second UV system in series or by reducing flow-through rates and storing treated water in a cistern. The use of two UV systems would provide redundancy and increase the system reliability at an energy cost however; these systems are well instrumented, so reliability of system functions can be monitored.

The UVT is an important factor in treatment efficiency and can be affected by water quality. Iron concentrations in residential wells are well below accepted maximums for these systems. The concentrations of calcium and magnesium are variable and calculated hardness of the typical Site residential water may fall below or above acceptable water hardness for UV systems. A water softening system may be required as a pretreatment for a UV system depending upon a location's water quality. UVT testing would be conducted if recommended by the manufacturer on a case by case basis after review of water quality information.

Since typical domestic water demand rates are normally greater than the desired treatment flow rate, the UV treatment alternative design would consider optimizing treatment efficiency by balancing flow rate and light energy requirements. This is a design rather than a feasibility question. One of the design options that could be considered is the sizing of the water system expansion tank(s) which could be increased to several hundred gallons. Treated water storage in expansion tanks may be negated by using UV systems in series, but the efficiency would need to be verified by site-specific testing for on-demand treatment and use.

UVT testing data if needed would be used in the adjustment of the UV treatment system to the Site. The alternative would include design and sizing of the UV system, installation and site specific testing for verification purposes.

4.3.1 Effectiveness

Based on influent concentrations and NDMA destruction efficiency estimates, the UV treatment of NDMA is considered to be a moderately to highly effective means to reduce NDMA concentrations to below the RAO and should be scalable for residential applications. If needed, the use of a large capacity pressure tanks can potentially provide consequential increases in treatment efficiency by reducing treatment flow rates. This treatment alternative is expected to achieve RAOs.

The long-term effectiveness of UV irradiation is expected to be high. The system will require minimal maintenance. Typical life of the UV lamps is two years. Quartz tubes that house the lamps may periodically need to be removed from the system and manually cleaned.

Sensors on the system are assumed to require replacement every ten years. Lamp sleeves will also require replacement every other year. The reliability of the system to reduce NDMA is proven in larger scale applications and should be equally reliable once demonstrated at the residential scale.

The short-term effectiveness of this alternative is expected to be high. The systems installation does not pose risk to workers, residents, or the environment. Overall the effectiveness of this alternative in the long and short-term is moderately high to high.

4.3.2 Implementability

The UV irradiation system components are readily available, easily installed and would provide a measurable factor of safety for treatment.

4.3.3 Cost

The installation of a point-of-use UV irradiation system alternative would include low to moderate capital and long-term costs. The capital costs include the cost to install the UV treatment system. Once installed, long-term costs will include the electricity, periodic monitoring, lamp replacements, sensor replacement, lamp sleeve replacement, quartz tube cleaning and maintenance of the disinfection system, as needed.

The total present worth cost for this remedial action alternative including initial capital costs and long-term O&M costs calculated for 30 years is \$95,000. Please refer to Table 4-4 for detailed costs.

5.0 COMPARATIVE ANALYSIS OF REMOVAL ACTION ALTERNATIVES

The purpose of this section is to compare the response alternatives to one another based on effectiveness, implementability, and cost. This section highlights advantages and disadvantages of each alternative relative to one another.

Effectiveness: The most effective alternatives are those that provide an alternative potable water supply. Replacing the impacted groundwater drinking water supply with non-impacted potable water immediately achieves the RAO.

Point-of-use treatment with UV irradiation also provides a reliable NDMA treatment and achieves the RAO.

Treatment of groundwater with coconut shell carbon would require verification by bench testing but was retained as a technology since it may achieve RAOs. This treatment method is not expected to be as effective or reliable as the other response alternatives. The use of coconut carbon will also require the most monitoring and maintenance.

Safety risks to residents, workers and the environment from construction of the response alternatives are highest with the extension of the water supply lines. Depending on location, this alternative may require a significant construction effort along roadways including blasting. No other alternative requires heavy construction. Construction risks are however easily managed.

Once installed, the extension of the water lines provides the highest reliability and permanence and will require limited maintenance. UV irradiation also provides a high degree of permanence with limited maintenance. Use of coconut charcoal for point of use treatment offers the lowest reliability and permanence as it will require more frequent monitoring and maintenance.

Implementability: All three of the alternatives provided herein are technically feasible. Implementation of a coconut carbon point of use treatment system will require more extensive bench testing and, if successful will require the greatest degree of performance sampling and most frequent O&M. The extension of the public water supply lines is the most technically complex alternative and would require the longest time frame for implementation.

Cost: The cost of the three alternatives varies based on material, labor, and long-term O&M costs and are summarized in Table 5-1. The most expensive response alternative is the extension of the water supply distribution main, where such extensions would be required. At locations where a municipal water supply distribution main currently exists, this alternative would be the least expensive. This alternative includes capital costs in design and construction including connection to impacted residences, and decommissioning of existing wells.

Coconut carbon while relatively inexpensive on a per pound basis will require bench testing and the most frequent operation and maintenance and environmental monitoring during implementation. This alternative will require the most extensive maintenance (media changes), analytical monitoring and reporting to verify effectiveness and reliability on an ongoing basis and

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is the most intrusive to the resident of all the alternatives. Over the long term, this alternative is likely to be the most expensive treatment alternative.

Depending on location, UV Irradiation is expected to be one of the least costly response alternative based on performance and cost information available. UV irradiation efficiency is increased at lower flow through treatment rates. For this reason, the use of a UV Irradiation with treated water storage may be beneficial to implementing treatment. This however, is only a design consideration and not a requirement for effective treatment. As discussed previously, a summary of the estimated response alternative costs is provided in Table 5-1.

6.0 SUMMARY AND CONCLUSIONS

Three response alternatives were evaluated for effectiveness of providing long-term source of potable water. These three alternatives were chosen from a longer list of alternatives because of the potential success of either replacing or treating potable water sources. Of the three alternatives evaluated at least two could be implemented with a high certainty of effectiveness, including water supply replacement alternatives and treatment by UV irradiation. Depending on location, either one of these would be a preferred alternative.

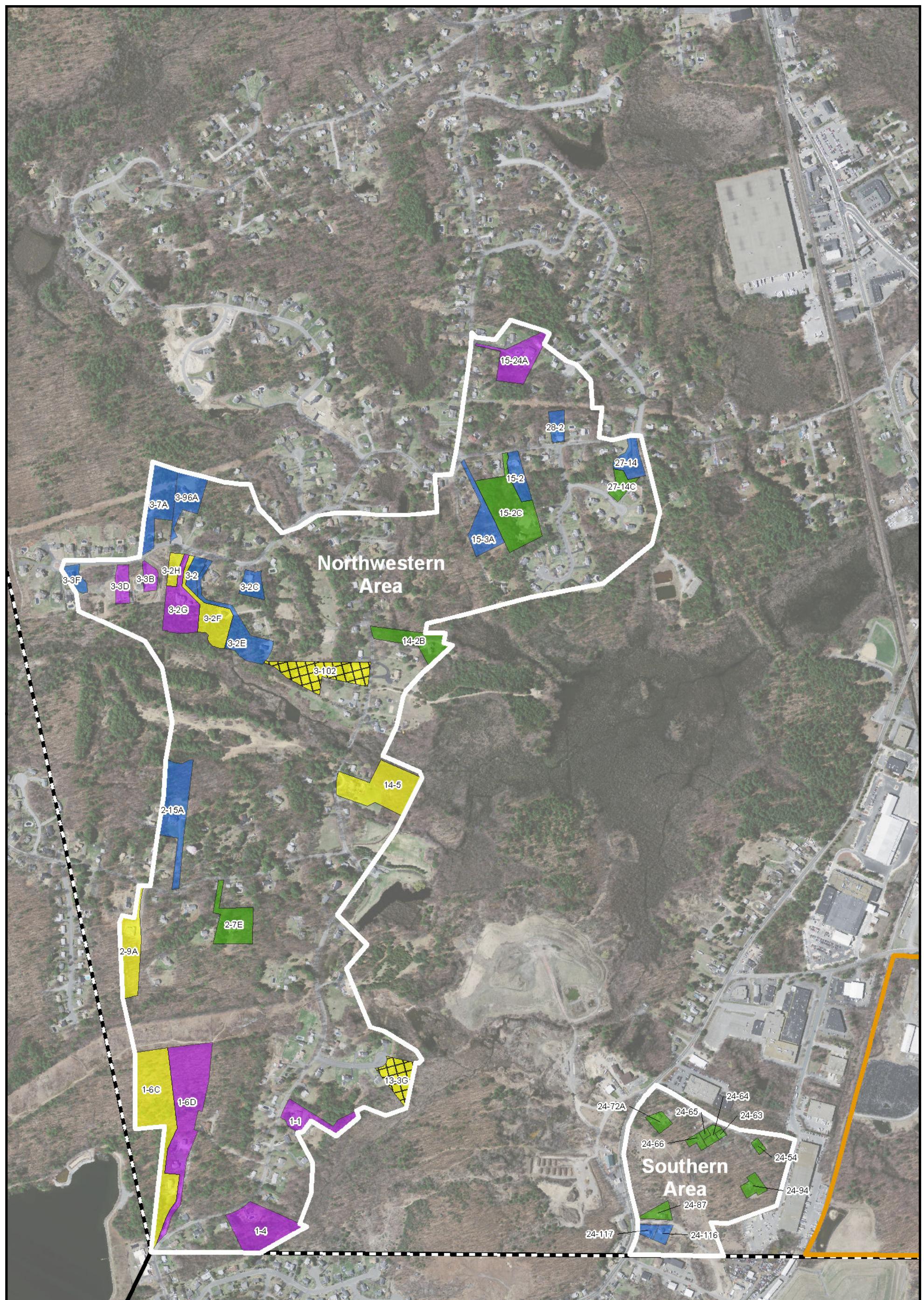
Further evaluation of point of use treatment by coconut charcoal would require bench testing to determine adsorption isotherms and breakthrough characteristics. This alternative is the least likely to be effective.

Due to the low cost of the UV irradiation systems and the simplicity of the plug in components, bench testing of UV irradiation would not be cost effective since the unit would have to be purchased anyway. Testing of UV irradiation should be conducted in the field to determine treatment efficiency.

7.0 REFERENCES

- AMEC, 2011, Response Alternatives Evaluation Work Plan. Olin Chemical Superfund Site, Wilmington, MA. Prepared by AMEC Environment & Infrastructure, Inc. on behalf of Olin Corporation. October 19, 2011, revised November 23, 2011.
- Davie, M., Reinhard, M., and Shapley, J. (2006), Metal-Catalyzed Reduction of N-Nitrosodimethylamine with Hydrogen in Water. *Environmental Science Technology*, 2006.
- Davie, M., Shih, K., Pacheco, F., Leckie, J., and Reinhard, M. (2008), Palladium-Indium Catalyzed Reduction of N-Nitrosodimethylamine: Indium as a Promoter Metal. *Environmental Science Technology*, 2008.
- Friedrich, A., Shapley, J., and Strathmann, T., (2008), Rapid Reduction of N-Nitrosamine Disinfection Byproducts in Water with Hydrogen and Porous Nickel Catalysts. *Environmental Science Technology*, 2008.
- GeoInsight, 2012, Letter Dated May 31, 2012 to USEPA transmitting Comments on Response Alternatives Evaluation Report, Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts.
- Friedrich, A., Joseph, C., and Strathmann, T., (2009) Catalytic Reduction of N-Nitrosodimethylamine with nanophase nickel-boron. *Applied Catalysis B: Environmental*, 2009.
- USEPA (2008). Emerging Contaminant-N-Nitrosodimethylamine (NDMA). Fact Sheet. USEPA Solid Waste and Emergency Response. EPA 505-F-07-006, April 2008.

FIGURES



Legend

- USEPA Identified Areas
- Quartermly Private Well Currently Being Sampled
- Phase I Private Well Sampling Location (Bedrock)
- Phase I Private Well Sampling Location (Overburden)
- Private Well (Irrigation Well)
- Private Well (Potable)
- 51 Eames St. Property Boundary



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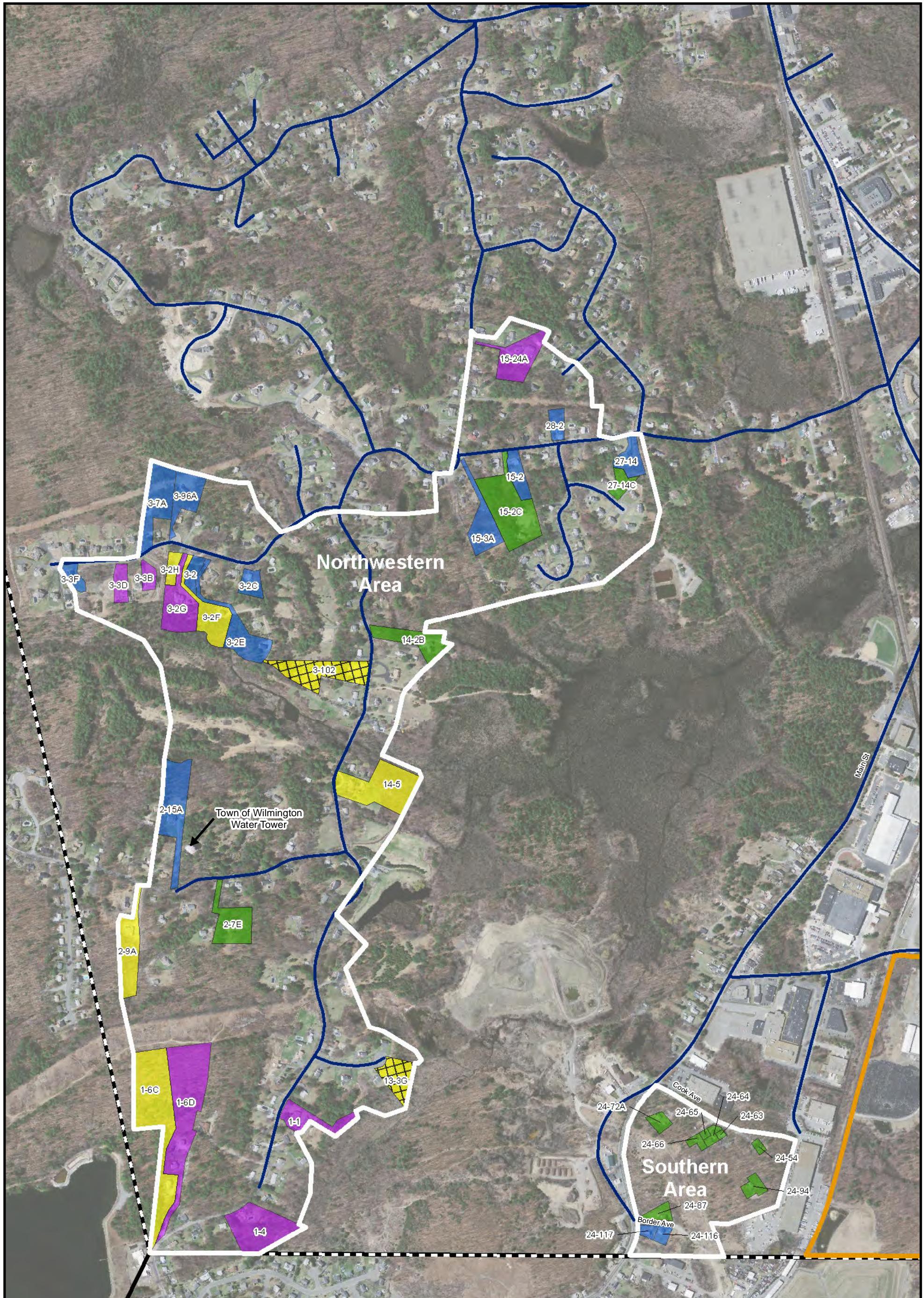


0 350 700 1,400
Feet

Figure 1
Private Well Locations

Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 11/08/11 | Checked/Date: PHT 11/08/11



Legend

- Legend**

 - Water Main
 - USEPA Identified Areas
 - Quartely Private Well Currently Being Sampled
 - Phase I Private Well Sampling Location (Bedrock)
 - Phase I Private Well Sampling Location (Overburden)
 - Private Well (Irrigation Well))
 - Private Well (Potable)
 - 51 Eames St. Property Boundary
 - Town Line

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A horizontal bar chart titled "Fee". The x-axis has numerical labels at 0, 350, 700, and 1,400. Three bars extend from the zero line to the right. The first bar reaches approximately 350 and is labeled "350". The second bar reaches approximately 700 and is labeled "700". The third bar reaches approximately 1,400 and is labeled "1,400".

Figure 2
Municipal Water Main Locations

Olin Chemical Superfund Site Wilmington, Massachusetts

Prepared/Date: BJR 03/28/12 Checked/Date: DGK 03/28/12

TABLES

Table 2-1
Summary of Groundwater Data from Private Wells Where NDMA Has Been Detected (2008-2011)
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	Frequency of Detection		Range of Non Detects		Range of Detected Concentrations		Average of All Samples	Drinking Water Standard / Guideline	Source	
Volatile Organics (mg/L)										
Carbon disulfide	3	/	37	0.01	:	0.01	0.00025	-	0.00064	0.0046
Chloromethane	1	/	46	0.0005	:	0.002	0.00026	-	0.00026	0.00084
Hydrazine	2	/	39	0.00005	:	0.0002	0.00005	-	0.000069	0.000066
Formaldehyde	5	/	39	0.03	:	0.75	0.0051	-	0.0077	0.033
Methyl Tertbutyl Ether	11	/	46	0.0005	:	0.001	0.00024	-	0.0031	0.00064
Semivolatile Organics (mg/L)										
1-Methylnaphthalene	2	/	44	0.0045	:	0.0053	0.000052	-	0.00015	0.0022
2-Methylnaphthalene	1	/	46	0.00091	:	0.0011	0.00032	-	0.00032	0.00047
Anthracene	1	/	46	0.00091	:	0.0011	0.00008	-	0.00008	0.00046
Benzo(a)anthracene	1	/	46	0.00027	:	0.00032	0.00032	-	0.00032	0.00014
Benzo(a)pyrene	1	/	55	0.00018	:	0.00024	0.00021	-	0.00021	0.000097
Benzo(b)fluoranthene	1	/	46	0.00027	:	0.00032	0.0002	-	0.0002	0.00014
Benzo(ghi)perylene	2	/	46	0.00045	:	0.00053	0.0001	-	0.00017	0.00023
Benzo(k)fluoranthene	1	/	46	0.00027	:	0.00032	0.00021	-	0.00021	0.00014
Benzoic Acid	4	/	34	0.0045	:	0.0053	0.0011	-	0.0013	0.0022
Bis(2-Ethylhexyl)phthalate	9	/	55	0.0018	:	0.02	0.00051	-	0.0099	0.0015
Butylbenzylphthalate	3	/	46	0.0045	:	0.0053	0.00057	-	0.00088	0.0022
Caprolactam	1	/	44	0.0045	:	0.0053	0.00094	-	0.00094	0.0023
Chrysene	2	/	46	0.00091	:	0.0011	0.00017	-	0.00026	0.00046
Dibenz(a,h)anthracene	1	/	46	0.00045	:	0.00053	0.00018	-	0.00018	0.00023
Di-n-butylphthalate	7	/	46	0.0045	:	0.0053	0.00074	-	0.0017	0.0022
Fluoranthene	1	/	46	0.00091	:	0.0011	0.00047	-	0.00047	0.00047
Fluorene	2	/	46	0.00091	:	0.0011	0.000088	-	0.00009	0.00045
Indeno(1,2,3-cd)pyrene	3	/	46	0.00045	:	0.00053	0.000093	-	0.00018	0.00023
N-Nitrosodimethylamine	27	/	69	1.9E-06	:	0.000019	0.0000054	-	0.000031	0.0000049
N-Nitrosodi-n-propylamine	3	/	60	1.9E-06	:	0.000019	0.0000057	-	0.000024	0.0000029
Phenanthrene	1	/	46	0.00018	:	0.00021	0.00021	-	0.00021	0.000095
Pyrene	1	/	46	0.0045	:	0.0053	0.00038	-	0.00038	0.0023
Metals, Total (mg/L)										
Calcium	60	/	60			19	-	100	67	
Chromium	9	/	67	0.005	:	0.01	0.00067	-	0.01	0.0026
Chromium, Hexavalent	1	/	7	0.001	:	0.001	0.00073	-	0.00073	0.00053
Sodium	67	/	67			6.2	-	64	22	20
Inorganics (mg/L)										
Chloride	67	/	67			2.5	-	200	91	250
Nitrate as N	45	/	67	0.05	:	0.05	0.054	-	6.3	1.0
Nitrite as N	1	/	67	0.01	:	0.1	0.012	-	0.012	0.023
Nitrogen, as Ammonia	6	/	67	0.1	:	0.1	0.11	-	0.25	0.061
Sulfate	67	/	67			13	-	46	23.2	250

Prepared by: BJR 3/28/12

Checked by: ÁJPVÁBEG 2012

mg/L - milligrams per liter
MCL - Federal and Massachusetts Maximum Contaminant Level - USEPA, 2011; MassDEP, 2011
SMCL - Federal and Massachusetts Secondary Maximum Contaminant Level - USEPA, 2011; MassDEP, 2011
ORSG - Massachusetts Drinking Water Guideline - MassDEP, 2011

Massachusetts Department of Environmental Protection (MassDEP), 2011. 2011 Standards and Guidelines for Contaminants in Massachusetts Drinking Water.

USEPA, 2011. 2011 Edition of the Drinking Water Standards and Health Advisories,
EPA 820-R-11-002.

Table 2-2: Summary of NDMA Results from Private Wells (2008-2011)

Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Location	Well Type	Field Sample ID	Sample Date	N-Nitrosodimethylamine (NDMA) (mg/L)
			Frequency of Detection:	27 / 103
			Range of Non Detects:	0.0000019 : 0.000019
			Range of Detected Concentrations:	0.00000054 - 0.000031
			Average of All Samples:	0.0000036
			Drinking Water Standard:	0.00001
M-01/L-06C	Potable	OC-M01L6C	10/12/2011	0.0000019 U
M-02/L-07E	Potable	OC-M02L07	12/5/2008	0.000002 U
		OC-M2L7	3/30/2010	0.0000019 U
		OC-M02L07	7/29/2010	0.000002 U
		OC-M02L07	11/5/2010	0.000005
		OC-M02L07	12/16/2010	0.0000056
		OC-M02L07	3/30/2011	0.0000058
		OC-M02L07	7/12/2011	0.0000019 U
		OC-M02L07	10/12/2011	0.000002 U
M-02/L-09A	Potable	OC-M02L9A	10/13/2011	0.0000019 U
M-03/L-02F	Potable	OC-M03L2F	10/12/2011	0.0000019 U
M-03/L-02H	Potable	OC-M03L2H	10/12/2011	0.000002 U
M-03/L-102	Irrigation	OC-M03L102	10/12/2011	0.0000019 U
M-13/L-03G	Irrigation	OC-M13L3G	10/12/2011	0.0000019 U
M-14/L-02B	Potable	OC-M14L2B	10/7/2008	0.000002 U
		OC-M14L2B	3/30/2010	0.000002 U
		OC-M14L2B	8/9/2010	0.000002 U
		OC-M14L2B	10/26/2010	0.0000019 UJ
		OC-M14L2B	12/16/2010	0.0000019 U
		OC-M14L2B	4/11/2011	0.0000019 U
		OC-M14L2B	7/12/2011	0.0000019 U
		OC-M14L2B	10/14/2011	0.0000019 U
M-14/L-05	Irrigation	OC-M14L05	10/12/2011	0.0000019 U
M-15/L-02C	Potable	OC-M15L2C	10/7/2008	0.000002 U
		OC-M15L2C	3/30/2010	0.0000019 U
		OC-M15L02C	8/4/2010	0.0000019 U
		OC-M15L2C	11/5/2010	0.0000019 U
		OC-M15L02C	12/17/2010	0.00000091 J
		OC-M15L2C	3/30/2011	0.0000019 U
		OC-M15L2C	7/13/2011	0.0000019 U
		OC-M15L2C	10/12/2011	0.000002 U
M-24/L-54	Potable	OC-M24L54	10/9/2008	0.0000094
		OC-M24L54 DUP	10/9/2008	0.0000088
		OC-M24L54	3/18/2009	0.000019
		OC-M24L54	11/10/2009	0.000017
		OC-M24L54-DUP	11/10/2009	0.000017
		OC-M24L54	3/30/2010	0.000017
		OC-M24L54	8/4/2010	0.000014
		OC-M24L54	10/26/2010	0.00002 J
		OC-M24L54	12/16/2010	0.000013
		OC-M24L54	3/30/2011	0.000014
		OC-M24L54	7/19/2011	0.000016
		OC-M24L54	10/12/2011	0.000012
M-24/L-63	Potable	OC-M24L63	10/7/2008	0.000002 U
		OC-M24L63	3/30/2010	0.0000019 U
		OC-M24L63	8/4/2010	0.0000019 U
		OC-M24L63	10/26/2010	0.000002 UJ
		OC-M24L63	12/16/2010	0.0000012 J
		OC-M24L63	3/30/2011	0.0000019 U
		OC-M24L63	7/12/2011	0.0000019 U
		OC-M24L63	10/13/2011	0.0000019 U

Table 2-2: Summary of NDMA Results from Private Wells (2008-2011)

**Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts**

Location	Well Type	Field Sample ID	Sample Date	N-Nitrosodimethylamine (NDMA) (mg/L)
M-24/L-64	Potable	OC-M24L64	1/20/2009	0.000002 U
		OC-M24L64	7/8/2010	0.000002 UJ
		OC-M24L64	8/4/2010	0.0000019 U
		OC-M24L64	11/9/2010	0.0000019 U
		OC-M24L64	12/17/2010	0.00000054 J
		OC-M24L64	3/30/2011	0.0000019 U
		OC-M24L64	7/12/2011	0.0000019 U
		OC-M24L64	10/13/2011	0.0000019 U
M-24/L-65	Potable	OC-M24L65	3/31/2011	0.0000019 U
		OC-M24L65	7/12/2011	0.0000019 U
		OC-M24L65	10/12/2011	0.0000019 U
M-24/L-66	Potable	OC-M24L66	12/5/2008	0.000002 U
		OC-M24L66	3/30/2010	0.0000019 U
		OC-M24L66	8/23/2010	0.0000019 U
		OC-M24L66	11/5/2010	0.0000019 U
		OC-M24L66	12/16/2010	0.000002 U
		OC-M24L66	3/31/2011	0.0000019 U
		OC-M24L66	7/12/2011	0.000002 U
		OC-M24L66	10/13/2011	0.0000019 U
M-24/L-72A	Potable	OC-M24L72A	10/8/2008	0.000002 U
		OC-M24L72A	3/30/2010	0.0000019 U
		OC-M24L72A	8/4/2010	0.0000019 U
		OC-M24L72A	10/26/2010	0.0000019 UJ
		OC-M24L72A	12/17/2010	0.000002 U
		OC-M24L72A	3/30/2011	0.0000032
		OC-M24L72A	7/13/2011	0.0000019 U
		OC-M24L72A	10/12/2011	0.0000019 U
M-24/L-87A	Potable	OC-M24L87	10/7/2008	0.000002 U
		OC-M24L87	3/30/2010	0.0000019 U
		OC-M24L87	8/4/2010	0.0000019 U
		OC-M24L87	11/5/2010	0.0000019 U
		OC-M24L87	12/16/2010	0.0000019 U
		OC-M24L87	3/30/2011	0.0000019 U
		OC-M24L87	7/12/2011	0.0000019 U
		OC-M24L87	10/12/2011	0.0000019 U
M-24/L-94	Potable	OC-M24L94	12/5/2008	0.000014
		OC-M24L94	3/18/2009	0.000002 U
		OC-M24L94	11/10/2009	0.0000063
		OC-M24L94	7/8/2010	0.0000019 UJ
		OC-M24L94	8/4/2010	0.000031
		OC-M24L94	9/29/2010	0.000017
		OC-M24L94	10/26/2010	0.0000041 J
		OC-M24L94	12/17/2010	0.000013
		OC-M24L94	3/30/2011	0.000019 U
		OC-M24L94	7/12/2011	0.0000019 U
M-27/L-14C	Irrigation	OC-M27L14C	10/7/2008	0.000002 U
		OC-M27L14C	7/1/2010	0.0000029
		OC-M27L14C	8/6/2010	0.0000021 U
		OC-M27L14C	10/25/2010	0.0000019 UJ
		OC-M27L14C	7/19/2011	0.0000019 U
		OC-M27L14C	10/13/2011	0.000002 U

Prepared by: BJR 7/13/12
Checked by: DGK 7/13/12

**Table 4-1: Screening of Groundwater Treatment Technologies
Response Alternatives Evaluation**

**Olin Chemical Superfund Site
Wilmington, Massachusetts**

General Response Action	Remedial Technology	Description	Site- and Waste-Limiting Characteristics	Screening Status
In-situ Treatment Considerations to Eliminate NDMA prior to entry household water well	Biological Treatment	Microorganisms and/or nutrients are added to the groundwater to enhance biological degradation under aerobic aquifer conditions.	NDMA is not readily degraded biologically. Delivery of nutrients/amendments to impacted areas in deep bedrock that is sparsely fractured with low transmissivity is technically difficult and unpredictable. The difficulty delivering amendments will reduce biodegradation rates, which for NDMA are already slow.	Eliminated
	Chemical Oxidation	Catalyzed oxidants (reagents) are injected into the groundwater to destroy contamination.	NDMA is typically destroyed by hydroxyl radicals. However, this technology will be difficult to apply on a small scale and is not appropriate for potable supplies or point of use treatment due to potential for un-reacted oxidants and/or catalysts.	Eliminated
	Air Stripping/ In-situ curtain	In well stripping-contamination is stripped from aqueous phase to vapor phase and removed /treated. Introducing air into aquifer to form and air sparge curtain between well and source.	NDMA does not readily volatilize (i.e., transfer from water to air) and has unlimited solubility. Therefore, sparging would not be effective.	Eliminated
	Dual-phase extraction	Not applicable	Contamination in dissolved phase and is not strippable	Eliminated
	Thermal treatment	Heating of contamination to break down contaminants.	NDMA is stable and not degraded by thermal treatment.	Eliminated
Containment	Physical Barrier/ grout curtain	Physical barrier constructed to separate private well from contaminated groundwater, by changing the zone of contribution to the pumped well	Not easily implemented in fractured bedrock due to heterogeneity in fracture openings (apertures) and fracture hydraulic properties.	Eliminated
	Hydraulic containment	Pump and treat system installation. Pumping of impacted water via extraction well(s) to surface for treatment and permitted discharge. Down-gradient groundwater migration is reduced by pumping action.	Bedrock borehole geophysical data in this part of the Site indicates bedrock is sparsely fractured making hydraulic containment difficult. Heterogeneity in fracture openings (apertures) and fracture hydraulic properties will make demonstration of capture effectiveness uncertain .	Eliminated
Engineering Controls	Extension of Waterlines Source	Replace drinking water source for private properties with municipal water by installing a water line.	Public water supply is available that could be extended to private residences and replace private wells as potable water source. Depending on location could require pump/lift station.	Retained
	Cistern Supply	Replace drinking water source for private properties to municipal water by installing a cistern tank at the residence that is replenished with a water truck.	Depending on access, cistern may require in-place fabrication, . Plumbing system would be modified as appropriate.	Retained

**Table 4-1: Screening of Groundwater Treatment Technologies
Response Alternatives Evaluation**

**Olin Chemical Superfund Site
Wilmington, Massachusetts**

General Response Action	Remedial Technology	Description	Site- and Waste-Limiting Characteristics	Screening Status
Ex-situ Point-of-Use Treatment	Air stripping	Contamination is stripped from aqueous phase to air phase.	NDMA does not readily volatilize (i.e., transfer from water to air)	Eliminated
	Adsorption	Contaminated groundwater is run through adsorbent and removed. Isotherm data is available for sorption of NDMA on various adsorbents including: Granular activated carbon (coal based), hydrophobic carbonaceous resins, coconut shell based carbon, hydrophilic sorbents.	Granular activated carbon (GAC). Published data indicates NDMA is poorly adsorbed to GAC.	Eliminated
			Coconut shell activated carbon: NDMA will adsorb to coconut shell activated carbon. Although reported adsorption capacity is low, may be applicable at low concentrations.	Retained
			Ambersorb 572 and XE-340, carbonaceous resins, are more effective than coconut shell in adsorbing NDMA, though also have low adsorption capacity. Dow Chemical Company discontinued Ambersorb; product no longer commercially available.	Eliminated
			Hydrophilic sorbents (silica, zeolites, acrylic resins) are ineffective at NDMA removal	Eliminated
	Ion Exchange	Contaminated water is passed through ion exchange media that attracts and binds contamination.	NDMA has low affinity to ion exchange resin rendering this technology ineffective.	Eliminated.
	Membrane Biological Reactor	Ex-situ biological treatment experiments indicate that propanotrophs (propane oxidizing bacteria) can co-metabolically transform NDMA to low (<2 ng/L concentrations). However, these are bench-scale studies and have not been proven full scale.	Some studies have shown that NDMA may be degraded biologically. The kinetics and complexity of operation are not suitable for residential applications.	Eliminated
	Metal-catalyzed reduction	Palladium or other metal catalyzed reduction of NDMA. Laboratory studies demonstrate effective destruction of NDMA using this technology. Full-scale treatment using this technology is not readily available.	Site groundwater includes other constituents which may "poison" metal-catalysis. Metals used as catalyst may also leach into treated water. Potential as promising future technology, not sufficiently demonstrated or developed for residential drinking water application at this time.	Eliminated
	Nano Filtration	Nano filtration uses a reverse flow membrane with pore throats in the 1 nanometer size range. It removes inorganic and organic constituents based on contaminant molecular weight	Nano filters are intended to remove organics with molecular weights greater than 200grams/mole. Not effective for NDMA removal which has a molecular weight of 74.08 grams/mole	Eliminated
	Reverse Osmosis	Selectively permeable membrane is used to separate contaminants from water.	NDMA can be treated through reverse osmosis but with only 50% removal efficiencies.	Eliminated
	UV Treatment	Contaminated groundwater is exposed to ultraviolet light which cleaves the N-N bond resulting in by product nitrite and dimethylamine(DMA), and methylamine	UV Irradiation. This is the primary treatment approach for NDMA at commercial scale. 1000 mJ/cm ² (milli-joules per centimeter squared) of energy is required to achieve 90% destruction of NDMA. Required energy can be provided by either low pressure or medium pressure mercury lamps. Available and proven technology at commercial scale, UV irradiation using low pressure lamps may be scalable to residential flows but would require verification testing. O&M affected by dissolved iron and hardness. May require pretreatment of hard water. May require treatment of byproducts.	Retained.

Notes:

GAC = Granular activated carbon
NDMA = n-Nitrosodimethylamine

Prepared By: DGK 01/06/12
Checked By: PHT 01/24/12
Revised By: DGK 03/15/12
Checked by PHT 04/02/2012

Table 4-2: Extension of Water Supply Line Costs
Response Alternatives Evaluation Report

Olin Chemical Superfund Site
Wilmington, Massachusetts

Description - Unit Cost Estimate Only	Quantity	Units	Unit Cost	Extended Cost
Planning & Preparation				
Dig-Safe / Markings	1	LS	\$700	\$700
Health & Safety Plan Addendum	1	LS	\$2,000	\$2,000
Design and Permitting- Distribution Main Extension	1	LS	\$40,000	\$40,000
Design and Permitting- Residential Supply Line	1	LS	\$2,000	\$2,000
Subtotal				\$44,700
Capital Costs- Residential Supply Line Connection				
Oversight	1	LS	\$2,000	\$2,000
Residential Connection (tap fee, meter, backflow preventer)	1	LS	\$8,000	\$8,000
Road Opening/ Repair	1	LS	\$2,000	\$2,000
Decommission Existing Well (Labor and Materials)	1	LS	\$5,500	\$5,500
Subtotal				\$17,500
Capital Costs- Municipal Distribution Main Extension				
Mobilization	1	LS	\$5,000	\$5,000
Road Opening	1	LS	\$4,000	\$4,000
Blasting (Bedrock)	1	Day	\$3,000	\$3,000
Force Main Installed (bedrock)	1	LF	\$140	\$140
Force Main Installed (insulated pipe)	1	LF	\$90	\$90
Construction Oversight	1	LS	\$20,000	\$20,000
Survey and Record Drawings	1	LS	\$3,000	\$3,000
Subtotal				\$35,230
Operations and Maintenance NPV (30 years)				
Per Household Annual water cost from MWRA (2011 Rates)	1	LS	\$10,078	\$11,000
			Subtotal	\$110,000
20% Contingency	1	LS	\$22,000	\$30,000
			Grand Total	\$140,000

TAT = Turnaround Time NPV = Net Present Value

LS = Lump Sum

LF = Linear Feet

Extended Costs are rounded numbers

Created by: DGK 03/07/12

Checked by: PHT 03/30/2012

Revised by: DGK 07/24/2012

Checked by: PHT 07/30/12

Notes & Assumptions:

- 1) Costs for water main Installation are unit prices based on engineers estimate and discussions between Olin and EPA
- 2) Costs for water hook up are engineers estimate, Blasting Means 22CY (approx) 25 LF/day
- 3) Residential connection assumed to be within 50 of roadway, unit rate estimate residence
- 4) NPV calculated for O&M Costs for 30 years with a discount rate of 2%, 2012 real discount rate, Office of Management and Budget Circular No. A-94, Appendix C.
- 5) Annual Water Rates from MWRA 2011 Advisory Board Report

Table 4-3: Point-of-use Treatment by Adsorption by Coconut Shell Activated Carbon Response Alternatives Evaluation Report

**Olin Chemical Superfund Site
Wilmington, Massachusetts**

Description	Quantity	Units	Unit Cost	Extended Cost
Planning & Preparation				
Health & Safety Plan	1	LS	\$900	\$900
Site Review/ Design	1	LS	\$2,500	\$2,500
Capital Costs				
Mobilization and Site Preparation	1	LS	\$1,000	\$1,000
Pilot test for Coconut Shell Activated Carbon	1	LS	\$10,000	\$10,000
Full-scale treatment test	1	LS	\$20,000	\$20,000
Treatment Tank Installation	1	LS	\$5,000	\$5,000
Treatment Media (Coconut Shell Activated Carbon)	440	lbs	\$4.00	\$1,760
Indoor Storage Tank and Piping Material Costs	1	LS	\$3,000	\$3,000
Pump, Expansion Tank, Pressure Switch	1	LS	\$1,200	\$1,200
Plumbing / Electrical	24	Hrs	\$85	\$2,040
Misc Subcontractor Material	1	LS	\$1,000	\$1,000
Oversight	2	Day	\$1,000	\$2,000
UV Disinfection System	1	LS	\$2,000	\$2,000
Water Sampling (monthly for 1st year)				
NDMA Analysis	15	Each	\$235	\$3,600
Total Colliform, Misc Micro	15	Each	\$40	\$600
Sampling and Reporting	1	LS	\$5,000	\$5,000
Operations and Maintenance NPV (30 years)				
Media changes (Frequency TBD), UV disinfection system maintenance and quarterly drinking water testing	1	LS	\$53,304	\$54,000
			Subtotal	\$116,000
20% Contingency	1	LS	\$23,200	\$24,000
			Grand Total	\$140,000

TAT = Turnaround Time NPV = Net Present Value

LS = Lump Sum lbs = pounds

Extended Costs are rounded numbers

Created by: DGK 03/19/12
 Checked by: PHT 03/30/2012
 Revised by: DGK 07/24/2012
 Checked by: PHT 07/30/2012

Notes & Assumptions:

- 1) Field effort based on 8-hour day @ \$75/hr plus vehicle rental and miscellaneous expenses.
- 2) Each tank is sized to hold 55-gallons of carbon media (220 lbs/tank).
- 3) O&M costs assume that 55-gallons of media require replacement each year.
- 4) NPV calculated for O&M Costs for 30 years with a discount rate of 2%, 2012 real discount rate, Office of Management and Budget Circular No. A-94, Appendix C.

Table 4-4: Point-of-use Treatment by UV Irradiation Response Alternatives Evaluation Report

**Olin Chemical Superfund Site
Wilmington, Massachusetts**

Scenario	Quantity	Units	Unit Cost	Extended Cost
Planning & Preparation				
Health & Safety Plan	1	LS	\$885	\$885
Site Review/ Design	1	LS	\$2,475	\$2,475
Capital Costs				
Mobilization and Site Preparation	1	LS	\$1,000	\$1,000
UV System (in line-2)	2	Each	\$3,800	\$7,600
Pump, Expansion Tanks, Pressure Switch	1	LS	\$1,000	\$1,000
Plumbing / Electrical	24	Hrs	\$85	\$2,040
Misc Subcontractor Material	1	LS	\$1,000	\$1,000
Oversight	2	Day	\$1,000	\$2,000
Water Softening System	1	LS	\$1,800	\$1,800
Water Sampling (monthly for 1st Qtr, then Qtrly)				
NDMA Analysis	11	Each	\$235	\$2,600
Total Colliform, Misc Micro Analysis	0	Each	\$40	\$0
Sampling and Reporting	1	LS	\$5,000	\$5,000
Operations and Maintenance NPV (30 years)				
UV and water softening system maintenance, quarterly drinking water testing, and electricity	1	LS	\$50,302	\$51,000
			Subtotal	\$79,000
20% Contingency	1	LS	\$15,800	\$16,000
			Grand Total	\$95,000

TAT = Turnaround Time NPV = Net Present Value

LS = Lump Sum

Extended Costs are rounded numbers

Created by: DGK 03/19/12
Checked by: PHT/03/30/2012
Revised by: DGK 07/24/2012
Checked by: PHT 07/30/2012

Notes & Assumptions:

- 1) Field effort based on 8-hour day @ \$75/hr plus vehicle rental and miscellaneous expenses.
- 2) UV treatment system includes two TrojanUVMax Pro50 series units to provide system redundancy.
- 3) Assumes Water Softening System Required for Hard Water
- 4) NPV calculated for O&M Costs for 30 years with a discount rate of 2%, 2012 real discount rate, Office of Management and Budget Circular No. A-94, Appendix C.

Table 5-1: Summary of Response Alternative Costs
Response Alternatives Evaluation Report

**Olin Chemical Superfund Site
Wilmington, Massachusetts**

Alternative	Capital Costs	NPV of O&M Costs for 30-years	Total Cost
Extension of Water Supply Costs	\$129,000	\$11,000	\$140,000
Point-of-use Treatment by Adsorption by Coconut Shell Activated Carbon	\$86,000	\$54,000	\$140,000
Point-of-use Treatment by UV Irradiation	\$44,000	\$51,000	\$95,000

NPV is net present value using a two percent interest rate.

Extension of Water Supply Costs are on unit basis per agreement w/USEPA

See Table 4-2 for unit costs. Detailed costs would be developed if implemented.

Created by: DGK 03/07/12

Checked by: PHT 03/30/2012

Revised by: DGK 07/24/12

Checked by: PHT 07/30/12

APPENDIX A
PRIVATE WELL DATA

Table A-1
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-01/L-06C
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-01/L-06C OC-M01L6C 10/12/2011
NDMA (mg/L) N-Nitrosodimethylamine	0.0000019 U

Prepared by / Date: KJC 03/27/12

Checked by / Date: BJR 03/29/12

mg/L = milligram per liter

U = not detected, value is the reporting limit

Table A-2
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-02/L-07E
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-02/L-07E OC-M02L07 12/5/2008	M-02/L-07E OC-M2L7 3/30/2010	M-02/L-07E OC-M02L07 7/29/2010	M-02/L-07E OC-M02L07 11/5/2010	M-02/L-07E OC-M02L07 12/16/2010	M-02/L-07E OC-M02L07 3/30/2011	M-02/L-07E OC-M02L07 7/12/2011	M-02/L-07E OC-M02L07 10/12/2011
Volatile Organics (mg/L)								
1,1,1,2-Tetrachloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1,1-Trichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
1,1,2,2-Tetrachloroethane	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
1,1,2-Trichloro-1,2,2-Trifluoroethane		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1,2-Trichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloroethylene	0.0005 UJ	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloropropene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,3-Trichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,3-Trichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,4-Trichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,4-Trimethylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dibromo-3-chloropropane	0.0005 UJ	0.005 U	0.005 U	0.005 UJ	0.005 U	0.005 U	0.005 U	
1,2-Dibromoethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3,5-Trimethylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,4-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,4-Dioxane		R	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U	0.05 UJ	
2,2-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	0.001 U	
2,4,4-Trimethyl-1-pentene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
2,4,4-Trimethyl-2-pentene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
2-Butanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
2-Chlorotoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
2-Hexanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	
4-Chlorotoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
4-iso-Propyltoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
4-Methyl-2-pentanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Acetic acid, methyl ester		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	
Acetone		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 U	
Benzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromochloromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromodichloromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 U	0.0005 U	
Bromoform	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Bromomethane	0.0005 U	0.002 UJ	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	

Table A-2
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-02/L-07E
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-02/L-07E OC-M02L07 12/5/2008	M-02/L-07E OC-M2L7 3/30/2010	M-02/L-07E OC-M02L07 7/29/2010	M-02/L-07E OC-M02L07 11/5/2010	M-02/L-07E OC-M02L07 12/16/2010	M-02/L-07E OC-M02L07 3/30/2011	M-02/L-07E OC-M02L07 7/12/2011	M-02/L-07E OC-M02L07 10/12/2011
Butane, 2-methoxy-2-methyl-		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 UJJ	
Carbon disulfide		0.01 U	0.01 U	0.01 U	0.01 UJJ	0.01 U	0.01 U	
Carbon tetrachloride	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJJ	0.001 U	0.001 U	
Chlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chlorodibromomethane	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
Chloroethane	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Chloroform	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chloromethane	0.0005 UJJ	0.002 U	0.00026 J	0.002 U	0.002 U	0.002 U	0.002 U	
Cis-1,2-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
cis-1,3-Dichloropropene	0.0005 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	
Cyclohexane		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Dibromomethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorodifluoromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJJ	0.001 UJJ	0.001 U	
Diethyl ether		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Ethyl benzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethyl-t-Butyl Ether		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 UJJ	
Hexachlorobutadiene	0.0005 U	0.0004 U	0.0004 U	0.0004 UJJ	0.0004 U	0.0004 U	0.0004 U	
Isopropyl ether		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Isopropylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methyl cyclohexane		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Methyl Tertbutyl Ether	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methylene chloride	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Naphthalene	0.0005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
n-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Propylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
sec-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Styrene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
tert-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrahydrofuran		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Toluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
trans-1,2-Dichloroethene	0.0005 UJJ	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
trans-1,3-Dichloropropene	0.0005 U	0.0004 U	0.0004 U	0.0004 UJJ	0.0004 U	0.0004 U	0.0004 U	
Trichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichlorofluoromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJJ	0.001 U	0.001 U	
Vinyl chloride	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 UJJ	0.0005 U	0.0005 U	
Xylene, o	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Xylenes (m&p)	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Semivolatile Organics (mg/L)								
1,2,4,5-Tetrachlorobenzene		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJJ

Table A-2
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-02/L-07E
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-02/L-07E OC-M02L07 12/5/2008	M-02/L-07E OC-M2L7 3/30/2010	M-02/L-07E OC-M02L07 7/29/2010	M-02/L-07E OC-M02L07 11/5/2010	M-02/L-07E OC-M02L07 12/16/2010	M-02/L-07E OC-M02L07 3/30/2011	M-02/L-07E OC-M02L07 7/12/2011	M-02/L-07E OC-M02L07 10/12/2011
1-Methylnaphthalene		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
2,3,4,6-Tetrachlorophenol		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
2,4,5-Trichlorophenol		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
2,4,6-Trichlorophenol		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
2,4-Dichlorophenol		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
2,4-Dimethylphenol		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
2,4-Dinitrophenol		0.0045 UJ	0.0045 U	0.0045 UJ	R	0.0045 U	0.0045 U	0.0049 UJ
2,4-Dinitrotoluene		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
2,6-Dinitrotoluene		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
2-Chloronaphthalene		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
2-Chlorophenol		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
2-Methylnaphthalene		0.00091 U	0.00091 U	0.00091 U	0.0011 U	0.00091 U	0.00091 U	0.00098 UJ
2-Methylphenol		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
2-Nitroaniline		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
2-Nitrophenol		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
3 & 4 Methylphenol		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
3,3`-Dichlorobenzidine		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
3-Nitroaniline		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 UJ	0.0045 U	0.0049 UJ
4,6-Dinitro-2-methylphenol		0.0045 U	0.0045 U	0.0045 UJ	R	R	0.0045 U	0.0049 UJ
4-Bromophenyl phenyl ether		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
4-Chloro-3-methylphenol		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
4-Chloroaniline		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
4-Chlorophenyl phenyl ether		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
4-Nitroaniline		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
4-Nitrophenol		0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Acenaphthene		0.00091 U	0.00091 U	0.00091 U	0.0011 U	0.00091 U	0.00091 U	0.00098 UJ
Acenaphthylene		0.00027 U	0.00027 U	0.00027 U	0.00032 U	0.00027 U	0.00027 U	0.00029 UJ
Acetophenone		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Alachlor	0.0002 U							
Aniline		0.0045 U	0.0045 UJ	0.0045 UJ	0.0053 UJ	0.0045 UJ	0.0045 U	0.0049 UJ
Anthracene		0.00091 U	0.00091 U	0.00091 U	0.0011 U	0.00091 U	0.00091 U	0.00098 UJ
Atrazine	0.0002 U	0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Azobenzene		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Benzaldehyde		0.0045 U	0.0045 U	0.0045 UJ	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Benzo(a)anthracene		0.00027 U	0.00027 U	0.00027 U	0.00032 U	0.00027 U	0.00027 U	0.00029 UJ
Benzo(a)pyrene	0.0002 U	0.00018 U	0.00018 U	0.00018 U	0.00021 U	0.00018 U	0.00018 U	0.0002 UJ
Benzo(b)fluoranthene		0.00027 U	0.00027 U	0.00027 U	0.00032 U	0.00027 U	0.00027 U	0.00029 UJ
Benzo(ghi)perylene		0.00045 U	0.00045 U	0.00045 U	0.00053 U	0.00045 U	0.00045 U	0.00049 UJ
Benzo(k)fluoranthene		0.00027 U	0.00027 U	0.00027 U	0.00032 U	0.00027 U	0.00027 U	0.00029 UJ
Benzoic Acid		0.0011 J	R	0.0045 U	0.0053 UJ	0.0045 UJ	0.0045 U	0.0049 UJ

Table A-2
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-02/L-07E
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-02/L-07E OC-M02L07 12/5/2008	M-02/L-07E OC-M2L7 3/30/2010	M-02/L-07E OC-M02L07 7/29/2010	M-02/L-07E OC-M02L07 11/5/2010	M-02/L-07E OC-M02L07 12/16/2010	M-02/L-07E OC-M02L07 3/30/2011	M-02/L-07E OC-M02L07 7/12/2011	M-02/L-07E OC-M02L07 10/12/2011
Benzyl alcohol		0.0091 U	0.0091 U	0.0091 U	0.011 U	0.0091 U	0.0091 U	0.0098 UJ
Biphenyl		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Bis(2-Chloroethoxy)methane		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Bis(2-Chloroethyl)ether		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Bis(2-Chloroisopropyl)ether		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Bis(2-Ethylhexyl)phthalate	0.0077 U	0.0099	0.00074 J	0.0023	0.0046 UJ	0.0049	0.0018 U	0.00071 J
Butylbenzylphthalate		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Caprolactam		0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0053 UJ	0.0045 UJ	0.0045 UJ	0.0049 UJ
Carbazole		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 UJ	0.0045 U	0.0049 UJ
Chrysene		0.00091 U	0.00091 U	0.00091 U	0.0011 U	0.00091 U	0.00091 U	0.00098 UJ
Di-2-ethylhexyladipate	0.0015 U							
Dibenz(a,h)anthracene		0.00045 U	0.00045 U	0.00045 U	0.00053 U	0.00045 U	0.00045 U	0.00049 UJ
Dibenzofuran		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Diethylphthalate		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Dimethylphthalate		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Di-n-butylphthalate		0.0015 J	0.0045 U	0.00074 J	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Di-n-octylphthalate		0.0045 U	0.0045 U	0.0045 U	0.0053 UJ	0.0045 U	0.0045 U	0.0049 UJ
Diphenyl ether		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Diphenylmethanone		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Endrin	0.00051 U							
Fluoranthene		0.00091 U	0.00091 U	0.00091 U	0.0011 U	0.00091 U	0.00091 U	0.00098 UJ
Fluorene		0.00091 U	0.00091 U	0.00091 U	0.0011 U	0.00091 U	0.00091 U	0.00098 UJ
Gamma-BHC/Lindane	0.0002 U							
Heptachlor	0.0002 U							
Heptachlor epoxide	0.0002 U							
Hexachlorobenzene	0.0002 U	0.00091 U	0.00091 U	0.00091 U	0.0011 U	0.00091 U	0.00091 U	0.00098 UJ
Hexachlorocyclopentadiene	0.002 U	0.0045 U	0.0045 U	0.0045 UJ	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Hexachloroethane		0.0027 U	0.0027 U	0.0027 U	0.0032 U	0.0027 U	0.0027 UJ	0.0029 UJ
Indeno(1,2,3-cd)pyrene		0.00045 U	0.00045 U	0.00045 U	0.00053 U	0.00045 U	0.00045 U	0.00049 UJ
Isophorone		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Methoxychlor	0.00051 U							
Nitrobenzene		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
N-Nitrosodi-n-propylamine		0.0000094 U	0.0000098 U	0.000002 U	0.000002 U	0.0000019 U	0.0000019 U	0.000002 U
N-Nitrosodiphenylamine		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Pentachlorophenol		0.00091 U	0.00091 U	0.00091 U	R	0.00091 U	0.00091 U	0.00098 UJ
Phenanthrene		0.00018 U	0.00018 U	0.00018 U	0.00021 U	0.00018 U	0.00018 U	0.0002 UJ
Phenol		0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0053 UJ	0.0045 UJ	0.0045 U	0.0049 UJ
Pyrene		0.0045 U	0.0045 U	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0049 UJ
Simazine	0.00051 U							

Table A-2
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-02/L-07E
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-02/L-07E OC-M02L07 12/5/2008	M-02/L-07E OC-M2L7 3/30/2010	M-02/L-07E OC-M02L07 7/29/2010	M-02/L-07E OC-M02L07 11/5/2010	M-02/L-07E OC-M02L07 12/16/2010	M-02/L-07E OC-M02L07 3/30/2011	M-02/L-07E OC-M02L07 7/12/2011	M-02/L-07E OC-M02L07 10/12/2011
NDMA (mg/L)								
N-Nitrosodimethylamine	0.000002 U	0.0000019 U	0.000002 U	0.000005	0.0000056	0.0000058	0.0000019 U	0.000002 U
Metals, Total (mg/L)								
Calcium	67	60 J	59	68	65	57	50	
Chromium	0.008 U	0.01	0.01 U	0.0018 J	0.0068	0.005 U	0.005 U	0.005 U
Sodium	8.1	7.4	6.2	7.6	7.9	6.9	7.8	8.9
Chromium, Hexavalent								0.001 U
Inorganics (mg/L)								
Chloride	17	14	14	20	18	12	16	29
Nitrate as N	5.5	5.7	3.5	6.1	6.1	6	4	6.3 J
Nitrite as N	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Nitrogen, as Ammonia	0.1 U	0.1 U	0.17	0.25	0.1 UJ	0.1 U	0.1 U	0.1 U
Sulfate	20	20	19	21	20	17	14	16
Specialty Compounds (mg/L)								
Hydrazine		0.0002 U	0.0002 UJ	0.0001 U	0.0001 U	0.0001 U	0.0001 U	
Monomethylhydrazine (MMH)		0.0005 U	0.0005 UJ	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
UDMH		0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
Acetaldehyde		0.03 U	0.03 UJ	0.03 U	0.75 U	0.03 U	0.03 U	
Formaldehyde		0.03 U	0.03 U	0.006 J	0.75 U	0.03 U	0.03 U	
Phthalic Acid/Phthalic anhydride		0.01 U						

mg/L = milligram per liter

U = not detected, value is the reporting limit

J = value is estimated

R = value is rejected

Prepared by / Date: KJC 03/27/12

Checked by / Date: BJR 03/29/12

Table A-3
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-02/L-09A
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-02/L09A OC-M02L9A 10/13/2011
NDMA (mg/L) N-Nitrosodimethylamine	0.0000019 U

Prepared by / Date: KJC 03/27/12

mg/L = milligram per liter

Checked by / Date: BJR 03/29/12

U = not detected, value is the reporting limit

Table A-4
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-03/L-02F
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-03/L-02F OC-M03L2F 10/12/2011
NDMA (mg/L) N-Nitrosodimethylamine	0.0000019 U

mg/L = milligram per liter

U = not detected, value is the reporting limit

Prepared by / Date: KJC 03/27/12

Checked by / Date: BJR 03/29/12

Table A-5
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-03/L-02H
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-03/L-02H OC-M03L2H 10/12/2011
NDMA (mg/L)	
N-Nitrosodimethylamine	0.000002 U

mg/L = milligram per liter

U = not detected, value is the reporting limit

Prepared by / Date: KJC 03/27/12

Checked by / Date: BJR 03/29/12

Table A-6
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-03/L-102
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-03/L-102 OC-M03L102 10/12/2011
NDMA (mg/L) N-Nitrosodimethylamine	0.0000019 U

mg/L = milligram per liter

U = not detected, value is the reporting limit

Prepared by / Date: KJC 03/27/12

Checked by / Date: BJR 03/29/12

Table A-7
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-13/L-03G
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-13/L-03G OC-M13L3G 10/12/2011
NDMA (mg/L) N-Nitrosodimethylamine	0.0000019 U

mg/L = milligram per liter

U = not detected, value is the reporting limit

Prepared by / Date: KJC 03/27/12

Checked by / Date: BJR 03/29/12

Table A-8
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-14/L-02B
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-14/L-02B OC-M14L2B 10/7/2008	M-14/L-02B OC-M14L2B 3/30/2010	M-14/L-02B OC-M14L2B 8/9/2010	M-14/L-02B OC-M14L2B 10/26/2010	M-14/L-02B OC-M14L2B 12/16/2010	M-14/L-02B OC-M14L2B 4/11/2011	M-14/L-02B OC-M14L2B 7/12/2011	M-14/L-02B OC-M14L2B 10/14/2011
Volatile Organics (mg/L)								
1,1,1,2-Tetrachloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1,1-Trichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
1,1,2,2-Tetrachloroethane	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
1,1,2-Trichloro-1,2,2-Trifluoroethane		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1,2-Trichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloropropene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,3-Trichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,3-Trichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,4-Trichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,4-Trimethylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dibromo-3-chloropropane	0.0005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	
1,2-Dibromoethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3,5-Trimethylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,4-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,4-Dioxane		R	0.05 U	0.05 UJ	0.05 UJ	R	0.05 UJ	
2,2-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
2,4,4-Trimethyl-1-pentene	0.001 U *	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
2,4,4-Trimethyl-2-pentene	0.001 UJ	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
2-Butanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Chlorotoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
2-Hexanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	
4-Chlorotoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
4-iso-Propyltoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
4-Methyl-2-pentanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Acetic acid, methyl ester		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Acetone		0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U	
Benzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromochloromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromodichloromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 U	0.0005 U	
Bromoform	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Bromomethane	0.0005 U	0.002 UJ	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	

Table A-8
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-14/L-02B
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-14/L-02B OC-M14L2B 10/7/2008	M-14/L-02B OC-M14L2B 3/30/2010	M-14/L-02B OC-M14L2B 8/9/2010	M-14/L-02B OC-M14L2B 10/26/2010	M-14/L-02B OC-M14L2B 12/16/2010	M-14/L-02B OC-M14L2B 4/11/2011	M-14/L-02B OC-M14L2B 7/12/2011	M-14/L-02B OC-M14L2B 10/14/2011
Butane, 2-methoxy-2-methyl-		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 UJ	
Carbon disulfide		0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	
Carbon tetrachloride	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Chlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chlorodibromomethane	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
Chloroethane	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Chloroform	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chloromethane	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Cis-1,2-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
cis-1,3-Dichloropropene	0.0005 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	
Cyclohexane		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Dibromomethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Dichlorodifluoromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 UJ	0.001 U	
Diethyl ether		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Ethyl benzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Ethyl-t-Butyl Ether		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 UJ	
Hexachlorobutadiene	0.0005 U	0.0004 U	0.0004 U	0.0004 UJ	0.0004 U	0.0004 U	0.0004 U	
Isopropyl ether		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Isopropylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Methyl cyclohexane		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Methyl Tertbutyl Ether	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Methylene chloride	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Naphthalene	0.0005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	
n-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Propylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
sec-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Styrene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
tert-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Tetrachloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Tetrahydrofuran		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Toluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.00021 J	0.00037 J	
trans-1,2-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
trans-1,3-Dichloropropene	0.0005 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	
Trichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Trichlorofluoromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Vinyl chloride	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 UJ	0.0005 U	0.0005 U	
Xylene, o	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Xylenes (m&p)	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	

Table A-8
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-14/L-02B
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-14/L-02B OC-M14L2B 10/7/2008	M-14/L-02B OC-M14L2B 3/30/2010	M-14/L-02B OC-M14L2B 8/9/2010	M-14/L-02B OC-M14L2B 10/26/2010	M-14/L-02B OC-M14L2B 12/16/2010	M-14/L-02B OC-M14L2B 4/11/2011	M-14/L-02B OC-M14L2B 7/12/2011	M-14/L-02B OC-M14L2B 10/14/2011
Semivolatile Organics (mg/L)								
1,2,4,5-Tetrachlorobenzene		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
1-Methylnaphthalene		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,3,4,6-Tetrachlorophenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,4,5-Trichlorophenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,4,6-Trichlorophenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,4-Dichlorophenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,4-Dimethylphenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,4-Dinitrophenol		0.0046 UJ	0.0045 U	0.0045 U	R	0.0045 U	0.0045 U	
2,4-Dinitrotoluene		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,6-Dinitrotoluene		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2-Choronaphthalene		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2-Chlorophenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2-Methylnaphthalene		0.00093 U	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00091 U	
2-Methylphenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2-Nitroaniline		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2-Nitrophenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
3 & 4 Methylphenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
3,3'-Dichlorobenzidine		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
3-Nitroaniline		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
4,6-Dinitro-2-methylphenol		0.0046 U	0.0045 U	0.0045 U	R	0.0045 U	0.0045 U	
4-Bromophenyl phenyl ether		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
4-Chloro-3-methylphenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
4-Chloroaniline		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
4-Chlorophenyl phenyl ether		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
4-Nitroaniline		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
4-Nitrophenol		0.0046 UJ	0.0045 UJ	0.0045 UJ	0.0045 U	0.0045 UJ	0.0045 U	
Acenaphthene		0.00093 U	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00091 U	
Acenaphthylene		0.00028 U	0.00027 U	0.00027 U	0.00027 U	0.00027 U	0.00027 U	
Acetophenone		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
Alachlor	0.00022 U							
Aniline		0.0046 U	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 U	
Anthracene		0.00093 U	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00091 U	
Atrazine	0.00022 U	0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
Azobenzene		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
Benzaldehyde		0.0046 U	0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	
Benzo(a)anthracene		0.00028 U	0.00027 U	0.00027 U	0.00027 U	0.00027 U	0.00027 U	
Benzo(a)pyrene	0.00022 U	0.00019 U	0.00018 U	0.00018 U	0.00018 U	0.00018 U	0.00018 U	
Benzo(b)fluoranthene		0.00028 U	0.00027 U	0.00027 U	0.00027 U	0.00027 U	0.00027 U	
Benzo(ghi)perylene		0.00046 U	0.00045 U	0.00045 U	0.00045 U	0.00045 U	0.00045 U	

Table A-8
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-14/L-02B
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-14/L-02B OC-M14L2B 10/7/2008	M-14/L-02B OC-M14L2B 3/30/2010	M-14/L-02B OC-M14L2B 8/9/2010	M-14/L-02B OC-M14L2B 10/26/2010	M-14/L-02B OC-M14L2B 12/16/2010	M-14/L-02B OC-M14L2B 4/11/2011	M-14/L-02B OC-M14L2B 7/12/2011	M-14/L-02B OC-M14L2B 10/14/2011
Benzo(k)fluoranthene		0.00028 U	0.00027 U	0.00027 U	0.00027 U	0.00027 U	0.00027 U	0.00027 U
Benzoic Acid		0.0011 J	R	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 U	0.0045 U
Benzyl alcohol		0.0093 U	0.0091 U	0.0091 U	0.0091 U	0.0091 U	0.0091 U	0.0091 U
Biphenyl		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Bis(2-Chloroethoxy)methane		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Bis(2-Chloroethyl)ether		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Bis(2-Chloroisopropyl)ether		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Bis(2-Ethylhexyl)phthalate	0.0022 U	0.0019 U	0.0018 U	0.0058 U	0.0018 UJ	0.0018 U	0.0018 U	
Butylbenzylphthalate		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Caprolactam		0.0046 UJ	0.0045 U	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	
Carbazole		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Chrysene		0.00093 U	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00091 U
Di-2-ethylhexyladipate	0.0016 U							
Dibenz(a,h)anthracene		0.00046 U	0.00045 U	0.00045 U	0.00045 U	0.00045 U	0.00045 U	0.00045 U
Dibenzofuran		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Diethylphthalate		0.0046 U	0.0045 U	0.0045 U	0.0046 U	0.0045 U	0.0045 U	0.0045 U
Dimethylphthalate		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Di-n-butylphthalate		0.0014 J	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Di-n-octylphthalate		0.0046 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U
Diphenyl ether		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Diphenylmethanone		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Endrin	0.00054 U							
Fluoranthene		0.00093 U	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00091 U
Fluorene		0.00093 U	0.00091 U	0.00091 U	0.000069 J	0.00091 U	0.00091 U	
Gamma-BHC/Lindane	0.00022 U							
Heptachlor	0.00022 U							
Heptachlor epoxide	0.00022 UJ							
Hexachlorobenzene	0.00022 U	0.00093 U	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00091 U	
Hexachlorocyclopentadiene	0.0022 U	0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
Hexachloroethane		0.0028 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0027 UJ
Indeno(1,2,3-cd)pyrene		0.00046 U	0.00045 U	0.00045 U	0.00045 U	0.00045 U	0.00045 U	0.00045 U
Isophorone		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Methoxychlor	0.00054 U							
Nitrobenzene		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
N-Nitrosodi-n-propylamine		0.00001 U	0.0000098 U	0.0000019 U	0.0000019 U	0.0000024	0.0000019 U	0.0000019 U
N-Nitrosodiphenylamine		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
Pentachlorophenol		0.00093 U	0.00091 U	0.00091 U	R	0.00091 U	0.00091 U	
Phenanthrene		0.00019 U	0.00018 U	0.00018 U	0.00018 U	0.00018 U	0.00018 U	0.00018 U
Phenol		0.0046 UJ	0.0045 UJ	0.0045 U	0.0045 UJ	0.0045 UJ	0.0045 U	0.0045 U
Pyrene		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U

Table A-8
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-14/L-02B
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-14/L-02B OC-M14L2B 10/7/2008	M-14/L-02B OC-M14L2B 3/30/2010	M-14/L-02B OC-M14L2B 8/9/2010	M-14/L-02B OC-M14L2B 10/26/2010	M-14/L-02B OC-M14L2B 12/16/2010	M-14/L-02B OC-M14L2B 4/11/2011	M-14/L-02B OC-M14L2B 7/12/2011	M-14/L-02B OC-M14L2B 10/14/2011
Simazine	0.00054 U							
NDMA (mg/L)								
N-Nitrosodimethylamine	0.000002 U	0.000002 U	0.000002 U	0.0000019 UJ	0.0000019 U	0.0000019 U	0.0000019 U	0.0000019 U
Metals, Total (mg/L)								
Calcium	69	36	43	33	38	37	42	
Chromium	0.005 U	0.005 U	0.0011 J	0.005 U	0.005 U	0.005 U	0.001 J	0.005 U
Sodium	46	26	29	22	25	25	27	29
Chromium, Hexavalent								0.001 UJ
Inorganics (mg/L)								
Chloride	10	11	13	13	12	11	13	12
Nitrate as N	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Nitrite as N	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Nitrogen, as Ammonia	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U
Sulfate	3.5	60	91	63	59	58	67	89
Specialty Compounds (mg/L)								
Hydrazine		0.0002 U	0.000098 J	0.0001 U	0.0001 U	0.0001 U	0.0001 U	
Monomethylhydrazine (MMH)		0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
UDMH		0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
Acetaldehyde		0.03 U	0.03 U	0.03 U	0.75 U	0.03 U	0.03 U	
Formaldehyde		0.03 U	0.0072 J	0.03 U	0.75 U	0.03 U	0.03 U	
Phthalic Acid/Phthalic anhydride		0.01 U						

mg/L = milligram per liter

Prepared by / Date: KJC 03/27/12

Checked by / Date: BJR 03/29/12

U = not detected, value is the reporting limit

J = value is estimated

R = value is rejected

Table A-9
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-14/L-05
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-14/L-05 OC-M14L05 10/12/2011
NDMA (mg/L) N-Nitrosodimethylamine	0.0000019 U

mg/L = milligram per liter

U = not detected, value is the reporting limit

Prepared by / Date: KJC 03/27/12

Checked by / Date: BJR 03/29/12

Table A-10
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-15/L-02C
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-15/L-02C OC-M15L2C 10/7/2008	M-15/L-02C OC-M15L2C 3/30/2010	M-15/L-02C OC-M15L02C 8/4/2010	M-15/L-02C OC-M15L2C 11/5/2010	M-15/L-02C OC-M15L02C 12/17/2010	M-15/L-02C OC-M15L2C 3/30/2011	M-15/L-02C OC-M15L2C 7/13/2011	M-15/L-02C OC-M15L2C 10/12/2011
Volatile Organics (mg/L)								
1,1,1,2-Tetrachloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1,1-Trichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
1,1,2,2-Tetrachloroethane	0.0005 U	0.0005 U	0.0005 U					
1,1,2-Trichloro-1,2,2-Trifluoroethane		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1,2-Trichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloropropene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,3-Trichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,3-Trichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,4-Trichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,4-Trimethylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dibromo-3-chloropropane	0.0005 U	0.005 U	0.005 U	0.005 UJ	0.005 U	0.005 U	0.005 U	
1,2-Dibromoethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3,5-Trimethylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,4-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,4-Dioxane		R	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U	0.05 UJ	
2,2-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	0.001 U	
2,4,4-Trimethyl-1-pentene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
2,4,4-Trimethyl-2-pentene	0.001 UJ	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
2-Butanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Chlorotoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
2-Hexanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	
4-Chlorotoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
4-iso-Propyltoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
4-Methyl-2-pentanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Acetic acid, methyl ester		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Acetone		0.05 UJ	0.05 UJ	0.05 U	0.05 UJ	0.05 UJ	0.05 U	
Benzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromochloromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromodichloromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 U	0.0005 U	
Bromoform	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Bromomethane	0.0005 U	0.002 UJ	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	

Table A-10
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-15/L-02C
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-15/L-02C OC-M15L2C 10/7/2008	M-15/L-02C OC-M15L2C 3/30/2010	M-15/L-02C OC-M15L02C 8/4/2010	M-15/L-02C OC-M15L2C 11/5/2010	M-15/L-02C OC-M15L02C 12/17/2010	M-15/L-02C OC-M15L2C 3/30/2011	M-15/L-02C OC-M15L2C 7/13/2011	M-15/L-02C OC-M15L2C 10/12/2011
Butane, 2-methoxy-2-methyl-		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 UJ	
Carbon disulfide		0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.00025 J	
Carbon tetrachloride	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Chlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chlorodibromomethane	0.0005 U	0.0005 U	0.0005 U					
Chloroethane	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Chloroform	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chloromethane	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Cis-1,2-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
cis-1,3-Dichloropropene	0.0005 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	
Cyclohexane		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Dibromomethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Dichlorodifluoromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 UJ	0.001 U	
Diethyl ether		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Ethyl benzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Ethyl-t-Butyl Ether		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 UJ	
Hexachlorobutadiene	0.0005 U	0.0004 U	0.0004 U	0.0004 UJ	0.0004 U	0.0004 U	0.0004 U	
Isopropyl ether		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Isopropylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Methyl cyclohexane		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Methyl Tertbutyl Ether	0.0005 U	0.00084 J	0.00051 J	0.00065 J	0.00056 J	0.00061 J	0.00063 J	
Methylene chloride	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Naphthalene	0.0005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	
n-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Propylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
sec-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Styrene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
tert-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Tetrachloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Tetrahydrofuran		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Toluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
trans-1,2-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
trans-1,3-Dichloropropene	0.0005 U	0.0004 U	0.0004 U	0.0004 UJ	0.0004 U	0.0004 U	0.0004 U	
Trichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Trichlorofluoromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Vinyl chloride	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 UJ	0.0005 U	0.0005 U	
Xylene, o	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Xylenes (m&p)	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	

Table A-10
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-15/L-02C
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-15/L-02C OC-M15L2C 10/7/2008	M-15/L-02C OC-M15L2C 3/30/2010	M-15/L-02C OC-M15L02C 8/4/2010	M-15/L-02C OC-M15L2C 11/5/2010	M-15/L-02C OC-M15L02C 12/17/2010	M-15/L-02C OC-M15L2C 3/30/2011	M-15/L-02C OC-M15L2C 7/13/2011	M-15/L-02C OC-M15L2C 10/12/2011
Semivolatile Organics (mg/L)								
1,2,4,5-Tetrachlorobenzene		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0049 UJ
1-Methylnaphthalene		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
2,3,4,6-Tetrachlorophenol		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
2,4,5-Trichlorophenol		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
2,4,6-Trichlorophenol		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
2,4-Dichlorophenol		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
2,4-Dimethylphenol		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
2,4-Dinitrophenol		0.0047 UJ	0.0045 UJ	0.0045 UJ	R	0.0045 U	0.0045 U	0.0049 UJ
2,4-Dinitrotoluene		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
2,6-Dinitrotoluene		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
2-Choronaphthalene		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
2-Chlorophenol		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
2-Methylnaphthalene		0.00094 U	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00099 UJ
2-Methylphenol		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
2-Nitroaniline		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
2-Nitrophenol		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
3 & 4 Methylphenol		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
3,3'-Dichlorobenzidine		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
3-Nitroaniline		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	0.0049 UJ
4,6-Dinitro-2-methylphenol		0.0047 U	0.0045 UJ	0.0045 UJ	R	R	0.0045 U	0.0049 UJ
4-Bromophenyl phenyl ether		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
4-Chloro-3-methylphenol		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
4-Chloroaniline		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
4-Chlorophenyl phenyl ether		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
4-Nitroaniline		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
4-Nitrophenol		0.0047 UJ	0.0045 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 UJ	0.0049 UJ
Acenaphthene		0.00094 U	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00099 UJ
Acenaphthylene		0.00028 U	0.00027 UJ	0.00027 U	0.00027 U	0.00027 U	0.00027 U	0.0003 UJ
Acetophenone		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
Alachlor	0.0002 U							
Aniline		0.0047 U	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0049 UJ
Anthracene		0.00094 U	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00099 UJ
Atrazine	0.0002 U	0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
Azobenzene		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
Benzaldehyde		0.0047 U	0.0045 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
Benzo(a)anthracene		0.00028 U	0.00027 UJ	0.00027 U	0.00027 U	0.00027 U	0.00027 U	0.0003 UJ
Benzo(a)pyrene	0.0002 U	0.00019 U	0.00018 UJ	0.00018 U	0.00018 U	0.00018 U	0.00018 U	0.0002 UJ
Benzo(b)fluoranthene		0.00028 U	0.00027 UJ	0.00027 U	0.00027 U	0.00027 U	0.00027 U	0.0003 UJ
Benzo(ghi)perylene		0.00047 U	0.00045 UJ	0.00045 U	0.00045 U	0.00045 U	0.00045 U	0.00049 UJ

Table A-10
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-15/L-02C
Response Alternatives Evaluation Report
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Parameter	M-15/L-02C OC-M15L2C 10/7/2008	M-15/L-02C OC-M15L2C 3/30/2010	M-15/L-02C OC-M15L02C 8/4/2010	M-15/L-02C OC-M15L2C 11/5/2010	M-15/L-02C OC-M15L02C 12/17/2010	M-15/L-02C OC-M15L2C 3/30/2011	M-15/L-02C OC-M15L2C 7/13/2011	M-15/L-02C OC-M15L2C 10/12/2011
Benzo(k)fluoranthene		0.00028 U	0.00027 UJ	0.00027 U	0.00027 U	0.00027 U	0.00027 U	0.0003 UJ
Benzoic Acid		0.0011 J	R	0.0045 U	0.0045 UJ	0.0045 UJ	0.0045 U	0.0049 UJ
Benzyl alcohol		0.0094 U	0.0091 UJ	0.0091 U	0.0091 U	0.0091 U	0.0091 U	0.0099 UJ
Biphenyl		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
Bis(2-Chloroethoxy)methane		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
Bis(2-Chloroethyl)ether		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
Bis(2-Chloroisopropyl)ether		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
Bis(2-Ethylhexyl)phthalate	0.002 U	0.0019 U	0.0018 UJ	0.00051 J	0.0018 UJ	0.0018 U	0.0018 U	0.002 UJ
Butylbenzylphthalate		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
Caprolactam		0.0047 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0049 UJ
Carbazole		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	0.0049 UJ
Chrysene		0.00094 U	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00099 UJ
Di-2-ethylhexyladipate	0.0015 U							
Dibenz(a,h)anthracene		0.00047 U	0.00045 UJ	0.00045 U	0.00045 U	0.00045 U	0.00045 U	0.00049 UJ
Dibenzo furan		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
Diethylphthalate		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
Dimethylphthalate		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
Di-n-butylphthalate		0.0017 J	0.0045 UJ	0.00088 J	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
Di-n-octylphthalate		0.0047 U	0.0045 UJ	0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0049 UJ
Diphenyl ether		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
Diphenylmethanone		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
Endrin	0.00051 U							
Fluoranthene		0.00094 U	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00099 UJ
Fluorene		0.00094 U	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00099 UJ
Gamma-BHC/Lindane	0.0002 U							
Heptachlor	0.0002 U							
Heptachlor epoxide	0.0002 U							
Hexachlorobenzene	0.0002 U	0.00094 U	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00099 UJ
Hexachlorocyclopentadiene	0.002 U	0.0047 U	0.0045 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 UJ	0.0049 UJ
Hexachloroethane		0.0028 U	0.0027 UJ	0.0027 U	0.0027 U	0.0027 U	0.0027 UJ	0.003 UJ
Indeno(1,2,3-cd)pyrene		0.00047 U	0.00045 UJ	0.00045 U	0.00045 U	0.00045 U	0.00045 U	0.00049 UJ
Isophorone		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
Methoxychlor	0.00051 U							
Nitrobenzene		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
N-Nitrosodi-n-propylamine		0.0000097 U	0.0000094 U	0.0000019 U	0.0000019 U	0.0000019 U	0.0000019 U	0.000002 U
N-Nitrosodiphenylamine		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ
Pentachlorophenol		0.00094 U	0.00091 UJ	0.00091 U	R	0.00091 U	0.00091 U	0.00099 UJ
Phenanthrene		0.00019 U	0.00018 UJ	0.00018 U	0.00018 U	0.00018 U	0.00018 U	0.0002 UJ
Phenol		0.0047 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 U	0.0049 UJ
Pyrene		0.0047 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0049 UJ

Table A-10
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-15/L-02C
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Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-15/L-02C OC-M15L2C 10/7/2008	M-15/L-02C OC-M15L2C 3/30/2010	M-15/L-02C OC-M15L02C 8/4/2010	M-15/L-02C OC-M15L2C 11/5/2010	M-15/L-02C OC-M15L02C 12/17/2010	M-15/L-02C OC-M15L2C 3/30/2011	M-15/L-02C OC-M15L2C 7/13/2011	M-15/L-02C OC-M15L2C 10/12/2011
Simazine	0.00051 U							
NDMA (mg/L)								
N-Nitrosodimethylamine	0.000002 U	0.0000019 U	0.0000019 U	0.0000019 U	0.00000091 J	0.0000019 U	0.0000019 U	0.000002 U
Metals, Total (mg/L)								
Calcium	100	94	75	87	85	89	90	
Chromium	0.005 U	0.005 U	0.0026 J	0.005 U				
Sodium	22	20	16	20	19	20	20	21
Chromium, Hexavalent								0.001 UJ
Inorganics (mg/L)								
Chloride	110	110	91	110	110	100	110	110
Nitrate as N	0.05 U	0.05 U	0.05 UJ	0.05 U				
Nitrite as N	0.01 U	0.01 U	0.1 U	0.1 U	0.01 U	0.1 U	0.01 U	0.1 UJ
Nitrogen, as Ammonia	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U
Sulfate	28	29	22	32	30	25	25	29
Specialty Compounds (mg/L)								
Hydrazine		0.00005 J	0.0002 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	
Monomethylhydrazine (MMH)		0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
UDMH		0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
Acetaldehyde		0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	
Formaldehyde		0.03 U	0.0077 J	0.0051 J	0.03 U	0.03 U	0.03 U	
Phthalic Acid/Phthalic anhydride		0.01 U						

mg/L = milligram per liter

Prepared by / Date: KJC 03/27/12

Checked by / Date: BJR 03/29/12

U = not detected, value is the reporting limit

J = value is estimated

R = value is rejected

Table A-11
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-54
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-54 OC-M24L54 10/9/2008	M-24/L-54 OC-M24L54 DUP 10/9/2008	M-24/L-54 OC-M24L54 3/18/2009	M-24/L-54 OC-M24L54 11/10/2009	M-24/L-54 OC-M24L54- DUP 11/10/2009	M-24/L-54 OC-M24L54 3/30/2010	M-24/L-54 OC-M24L54 8/4/2010	M-24/L-54 OC-M24L54 10/26/2010	M-24/L-54 OC-M24L54 12/16/2010	M-24/L-54 OC-M24L54 3/30/2011	M-24/L-54 OC-M24L54 7/19/2011	M-24/L-54 OC-M24L54 10/12/2011
Volatile Organics (mg/L)												
1,1,1,2-Tetrachloroethane	0.0005 U	0.0005 U		0.001 U	0.001 U							
1,1,1-Trichloroethane	0.0005 U	0.0005 U		0.001 U	0.001 U							
1,1,2,2-Tetrachloroethane	0.0005 U	0.0005 U		0.0005 U	0.0005 U							
1,1,2-Trichloro-1,2,2-Trifluoroethane				0.001 U	0.001 U							
1,1,2-Trichloroethane	0.0005 U	0.0005 U		0.001 U	0.001 U							
1,1-Dichloroethane	0.0005 U	0.0005 U		0.001 U	0.001 U							
1,1-Dichloroethene	0.0005 U	0.0005 U		0.001 U	0.001 U							
1,1-Dichloropropene	0.0005 U	0.0005 U		0.001 U	0.001 U							
1,2,3-Trichlorobenzene	0.0005 U	0.0005 U		0.001 U	0.001 U							
1,2,3-Trichloropropane	0.0005 U	0.0005 U		0.001 U	0.001 U							
1,2,4-Trichlorobenzene	0.0005 U	0.0005 U		0.001 U	0.001 U							
1,2,4-Trimethylbenzene	0.0005 U	0.0005 U		0.001 U	0.001 U							
1,2-Dibromo-3-chloropropane	0.0005 U	0.0005 U		0.005 U	0.005 U							
1,2-Dibromoethane	0.0005 U	0.0005 U		0.001 U	0.001 U							
1,2-Dichlorobenzene	0.0005 U	0.0005 U		0.001 U	0.001 U							
1,2-Dichloroethane	0.0005 U	0.0005 U		0.001 U	0.001 U							
1,2-Dichloropropane	0.0005 U	0.0005 U		0.001 U	0.001 U							
1,3,5-Trimethylbenzene	0.0005 U	0.0005 U		0.001 U	0.001 U							
1,3-Dichlorobenzene	0.0005 U	0.0005 U		0.001 U	0.001 U							
1,3-Dichloropropane	0.0005 U	0.0005 U		0.001 U	0.001 U							
1,4-Dichlorobenzene	0.0005 U	0.0005 U		0.001 U	0.001 U							
1,4-Dioxane					0.05 U	0.05 U						
2,2-Dichloropropane	0.0005 U	0.0005 U		0.001 UJ	0.001 UJ							
2,4,4-Trimethyl-1-pentene	0.001 U	0.001 U		0.001 U	0.001 U							
2,4,4-Trimethyl-2-pentene	0.001 U	0.001 U		0.001 U	0.001 U							
2-Butanone					0.01 U	0.01 U						
2-Chlorotoluene	0.0005 U	0.0005 U		0.001 U	0.001 U							
2-Hexanone					0.01 U	0.01 U						
4-Chlorotoluene	0.0005 U	0.0005 U		0.001 U	0.001 U							
4-iso-Propyltoluene	0.0005 U	0.0005 U		0.001 U	0.001 U							
4-Methyl-2-pentanone					0.01 U	0.01 U						
Acetic acid, methyl ester					0.01 U	0.01 U						
Acetone					0.05 U	0.05 U						
Benzene	0.0005 U	0.0005 U		0.001 U	0.001 U							
Bromobenzene	0.0005 U	0.0005 U		0.001 U	0.001 U							
Bromochloromethane	0.0005 U	0.0005 U		0.001 U	0.001 U							
Bromodichloromethane	0.0005 U	0.0005 U		0.001 U	0.001 U							
Bromoform	0.0005 U	0.0005 U		0.001 U	0.001 U							
Bromomethane	0.0005 U	0.0005 U		0.002 UJ	0.002 UJ							
Butane, 2-methoxy-2-methyl-					0.005 UJ	0.005 UJ						
Carbon disulfide					0.01 U	0.01 U						
Carbon tetrachloride	0.0005 U	0.0005 U		0.001 U	0.001 U							
Chlorobenzene	0.0005 U	0.0005 U		0.001 U	0.001 U							
Chlorodibromomethane	0.0005 U	0.0005 U		0.0005 U	0.0005 U							
Chloroethane	0.0005 U	0.0005 U		0.002 U	0.002 U							
Chloroform	0.0005 U	0.0005 U		0.001 U	0.001 U							
Chloromethane	0.0005 U	0.0005 U		0.002 U	0.002 U							
Cis-1,2-Dichloroethene	0.0005 U	0.0005 U		0.001 U	0.001 U							

Table A-11
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-54
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-54 OC-M24L54 10/9/2008	M-24/L-54 OC-M24L54 DUP 10/9/2008	M-24/L-54 OC-M24L54 3/18/2009	M-24/L-54 OC-M24L54 11/10/2009	M-24/L-54 OC-M24L54- DUP 11/10/2009	M-24/L-54 OC-M24L54 3/30/2010	M-24/L-54 OC-M24L54 8/4/2010	M-24/L-54 OC-M24L54 10/26/2010	M-24/L-54 OC-M24L54 12/16/2010	M-24/L-54 OC-M24L54 3/30/2011	M-24/L-54 OC-M24L54 7/19/2011	M-24/L-54 OC-M24L54 10/12/2011
cis-1,3-Dichloropropene	0.0005 U	0.0005 U		0.0004 U	0.0004 U							
Cyclohexane				0.01 U	0.01 U							
Dibromomethane	0.0005 U	0.0005 U		0.001 U	0.001 U							
Dichlorodifluoromethane	0.0005 U	0.0005 U		0.001 U	0.001 U							
Diethyl ether				0.01 U	0.01 U							
Ethyl benzene	0.0005 U	0.0005 U		0.001 U	0.001 U							
Ethyl-t-Butyl Ether				0.005 UJ	0.005 UJ							
Hexachlorobutadiene	0.0005 U	0.0005 U		0.0004 U	0.0004 U							
Isopropyl ether				0.01 U	0.01 U							
Isopropylbenzene	0.0005 U	0.0005 U		0.001 U	0.001 U							
Methyl cyclohexane				0.01 U	0.01 U							
Methyl Tertiobutyl Ether	0.0026	0.0031		0.002	0.0019							
Methylene chloride	0.0005 U	0.0005 U		0.002 U	0.002 U							
Naphthalene	0.0005 U	0.0005 U		0.005 U	0.005 U							
n-Butylbenzene	0.0005 U	0.0005 U		0.001 U	0.001 U							
Propylbenzene	0.0005 U	0.0005 U		0.001 U	0.001 U							
sec-Butylbenzene	0.0005 U	0.0005 U		0.001 U	0.001 U							
Styrene	0.0005 U	0.0005 U		0.001 U	0.001 U							
tert-Butylbenzene	0.0005 U	0.0005 U		0.001 U	0.001 U							
Tetrachloroethene	0.0005 U	0.0005 U		0.001 U	0.001 U							
Tetrahydrofuran				0.01 U	0.01 U							
Toluene	0.0005 U	0.0005 U		0.001 U	0.001 U							
trans-1,2-Dichloroethene	0.0005 U	0.0005 U		0.001 U	0.001 U							
trans-1,3-Dichloropropene	0.0005 U	0.0005 U		0.0004 U	0.0004 U							
Trichloroethene	0.0005 U	0.0005 U		0.001 U	0.001 U							
Trichlorofluoromethane	0.0005 U	0.0005 U		0.001 U	0.001 U							
Vinyl chloride	0.0005 U	0.0005 U		0.0005 U	0.0005 U							
Xylene, o	0.0005 U	0.0005 U		0.001 U	0.001 U							
Xylenes (m&p)	0.001 U	0.001 U		0.002 U	0.002 U							
Semivolatile Organics (mg/L)												
1,2,4,5-Tetrachlorobenzene			0.0051 U	0.0049 U	0.0045 U							0.0048 UJ
1,2,4-Trichlorobenzene			0.0051 U									
1,2-Dichlorobenzene			0.0051 U									
1,3-Dichlorobenzene			0.0051 U									
1,4-Dichlorobenzene			0.0051 U									
1-Methylnaphthalene				0.0049 U	0.0045 U							0.0048 UJ
2,3,4,6-Tetrachlorophenol				0.0049 U	0.0045 U							0.0048 UJ
2,4,5-Trichlorophenol			0.0051 U	0.0049 U	0.0045 U							0.0048 UJ
2,4,6-Trichlorophenol			0.0051 U	0.0049 U	0.0045 U							0.0048 UJ
2,4-Dichlorophenol			0.0051 U	0.0049 U	0.0045 U							0.0048 UJ
2,4-Dimethylphenol			0.0051 U	0.0049 U	0.0045 U							0.0048 UJ
2,4-Dinitrophenol			0.0051 U	0.0049 UJ	0.0045 UJ							0.0048 UJ
2,4-Dinitrotoluene			0.0051 U	0.0049 U	0.0045 U							0.0048 UJ
2,6-Dinitrotoluene			0.0051 U	0.0049 U	0.0045 U							0.0048 UJ
2-Chloronaphthalene			0.0051 U	0.0049 U	0.0045 U							0.0048 UJ
2-Chlorophenol			0.0051 U	0.0049 U	0.0045 U							0.0048 UJ
2-Methylnaphthalene			0.001 U	0.00097 U	0.00091 U							0.00097 UJ
2-Methylphenol			0.0051 U	0.0049 U	0.0045 U							0.0048 UJ
2-Nitroaniline			0.0051 U	0.0049 U	0.0045 U							0.0048 UJ

Table A-11
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Parameter	M-24/L-54 OC-M24L54 10/9/2008	M-24/L-54 OC-M24L54 DUP 10/9/2008	M-24/L-54 OC-M24L54 3/18/2009	M-24/L-54 OC-M24L54 11/10/2009	M-24/L-54 OC-M24L54- DUP 11/10/2009	M-24/L-54 OC-M24L54 3/30/2010	M-24/L-54 OC-M24L54 8/4/2010	M-24/L-54 OC-M24L54 10/26/2010	M-24/L-54 OC-M24L54 12/16/2010	M-24/L-54 OC-M24L54 3/30/2011	M-24/L-54 OC-M24L54 7/19/2011	M-24/L-54 OC-M24L54 10/12/2011
2-Nitrophenol				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
3 & 4 Methylphenol				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
3,3' -Dichlorobenzidine				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
3-Nitroaniline				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
4,6-Dinitro-2-methylphenol				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
4-Bromophenyl phenyl ether				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
4-Chloro-3-methylphenol				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
4-Chloroaniline				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
4-Chlorophenyl phenyl ether				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
4-Nitroaniline					0.0049 U	0.0045 U						0.0048 UJ
4-Nitrophenol				0.0051 UJ	0.0049 UJ	0.0045 UJ						0.0048 UJ
Acenaphthene				0.001 U	0.00097 U	0.00091 U						0.00097 UJ
Acenaphthylene				0.0003 U	0.00029 U	0.00027 U						0.00029 UJ
Acetophenone				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
Aalachlor	0.00021 U	0.00021 U										
Aniline				0.0051 UJ	0.0049 UJ	0.0045 UJ						0.0048 UJ
Anthracene				0.001 U	0.00097 U	0.00091 U						0.00097 UJ
Atrazine	0.00021 U	0.00021 U			0.0049 U	0.0045 U						0.0048 UJ
Azobenzene				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
Benzaldehyde					0.0049 U	0.0045 U						0.0048 UJ
Benzo(a)anthracene				0.0003 U	0.00029 U	0.00027 U						0.00029 UJ
Benzo(a)pyrene	0.00021 U	0.00021 U		0.0002 U	0.00019 U	0.00018 U						0.00019 UJ
Benzo(b)fluoranthene				0.0003 U	0.00029 U	0.00027 U						0.00029 UJ
Benzo(ghi)perylene				0.00051 U	0.00049 U	0.00045 U						0.00048 UJ
Benzo(k)fluoranthene				0.0003 U	0.00029 U	0.00027 U						0.00029 UJ
Benzoic Acid					R	R						0.0048 UJ
Benzyl alcohol					0.0097 U	0.0091 U						0.0097 UJ
Biphenyl					0.0049 U	0.0045 U						0.0048 UJ
Bis(2-Chloroethoxy)methane				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
Bis(2-Chloroethyl)ether				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
Bis(2-Chloroisopropyl)ether				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
Bis(2-Ethylhexyl)phthalate	0.0021 U	0.0021 U		0.003 U	0.0019 U	0.0018 U						0.0019 UJ
Butylbenzylphthalate				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
Caprolactam					0.0049 U	0.0045 U						0.0048 UJ
Carbazole					0.0049 U	0.0045 U						0.0048 UJ
Chrysene				0.001 U	0.00097 U	0.00091 U						0.00097 UJ
Di-2-ethylhexyladipate	0.0016 U	0.0016 U										
Dibenz(a,h)anthracene				0.00051 U	0.00049 U	0.00045 U						0.00048 UJ
Dibenzo furan				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
Diethylphthalate				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
Dimethylphthalate				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
Di-n-butylphthalate				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
Di-n-octylphthalate				0.0051 U	0.0049 U	0.0045 U						0.0048 UJ
Diphenyl ether					0.0049 U	0.0045 U						0.0048 UJ
Diphenylmethanone					0.0049 U	0.0045 U						0.0048 UJ
Endrin	0.00052 U	0.00053 U										
Fluoranthene				0.001 U	0.00097 U	0.00091 U						0.00097 UJ
Fluorene				0.001 U	0.00097 U	0.00091 U						0.00097 UJ
Gamma-BHC/Lindane	0.00021 U	0.00021 U										

Table A-11
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-54
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Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-54 OC-M24L54 10/9/2008	M-24/L-54 OC-M24L54 DUP 10/9/2008	M-24/L-54 OC-M24L54 3/18/2009	M-24/L-54 OC-M24L54 11/10/2009	M-24/L-54 OC-M24L54- DUP 11/10/2009	M-24/L-54 OC-M24L54 3/30/2010	M-24/L-54 OC-M24L54 8/4/2010	M-24/L-54 OC-M24L54 10/26/2010	M-24/L-54 OC-M24L54 12/16/2010	M-24/L-54 OC-M24L54 3/30/2011	M-24/L-54 OC-M24L54 7/19/2011	M-24/L-54 OC-M24L54 10/12/2011
Heptachlor	0.00021 UJ	0.00021 UJ										
Heptachlor epoxide	0.00021 U	0.00021 U										
Hexachlorobenzene	0.00022 U	0.00022 U	0.001 U	0.00097 U	0.00091 U							0.00097 UJ
Hexachlorobutadiene			0.0004 U									
Hexachlorocyclopentadiene	0.0021 UJ	0.0021 UJ		0.0049 UJ	0.0045 UJ							0.0048 UJ
Hexachloroethane			0.003 U	0.0029 U	0.0027 U							0.0029 UJ
Indeno(1,2,3-cd)pyrene			0.00051 U	0.00049 U	0.00045 U							0.00048 UJ
Isophorone			0.0051 U	0.0049 U	0.0045 U							0.0048 UJ
Methoxychlor	0.00052 U	0.00053 U										
Naphthalene			0.001 U									
Nitrobenzene			0.0051 U	0.0049 U	0.0045 U							0.0048 UJ
N-Nitrosodi-n-propylamine			0.00001 U	0.000011 U	0.0000098 U	0.000024	0.0000094 U	0.0000019 U	0.0000019 U	0.0000019 U	0.0000019 U	0.0000019 U
N-Nitrosodiphenylamine				0.0049 U	0.0045 U							0.0048 UJ
Pentachlorophenol			0.001 U	0.00097 U	0.00091 U							0.00097 UJ
Phenanthrene			0.0002 U	0.00019 U	0.00018 U							0.00019 UJ
Phenol			0.0051 UJ	0.0049 UJ	0.0045 UJ							0.0048 UJ
Pyrene			0.0051 U	0.0049 U	0.0045 U							0.0048 UJ
Simazine	0.00056 U	0.00056 U										
NDMA (mg/L)												
N-Nitrosodimethylamine	0.0000094	0.0000088	0.000019	0.000017	0.000017	0.000017	0.000014	0.00002 J	0.000013	0.000014	0.000016	0.000012
Metals, Total (mg/L)												
Calcium	46	45		47	47	45	44	44	42	44	44	
Chromium	0.005 U	0.005 U		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Sodium	31	30		28	27	27	28	26	26	27	25	27
Chromium, Hexavalent												0.001 U
Inorganics (mg/L)												
Chloride	72	71		72	72	76	76	86	48	74	76	75
Nitrate as N	0.05 U	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Nitrite as N	0.01 U	0.01 U		0.01 U	0.01 U	0.01 U	0.1 U	0.01 U	0.01 U	0.1 U	0.01 U	0.01 U
Nitrogen, as Ammonia	0.1 U	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U
Sulfate	26	26		27	27	27	28	31	27	25	23	27
Specialty Compounds (mg/L)												
Hydrazine			0.00005 U	0.0002 U	0.0002 U							
Monomethylhydrazine (MMH)			0.00025 U	0.0005 U	0.0005 U							
UDMH			0.00025 U	0.0005 U	0.0005 U							
Acetaldehyde				0.1 U	0.03 U	0.03 U						
Formaldehyde				0.05 U	0.03 U	0.03 U						

mg/L = milligram per liter

U = not detected, value is the reporting limit

J = value is estimated

R = value is rejected

Prepared by / Date: KJC 03/27/12

Checked by / Date: BJR 03/29/12

Table A-12
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-63
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-63 OC-M24L63 10/7/2008	M-24/L-63 OC-M24L63 3/30/2010	M-24/L-63 OC-M24L63 8/4/2010	M-24/L-63 OC-M24L63 10/26/2010	M-24/L-63 OC-M24L63 12/16/2010	M-24/L-63 OC-M24L63 3/30/2011	M-24/L-63 OC-M24L63 7/12/2011	M-24/L-63 OC-M24L63 10/13/2011
Volatile Organics (mg/L)								
1,1,1,2-Tetrachloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1,1-Trichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
1,1,2,2-Tetrachloroethane	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
1,1,2-Trichloro-1,2,2-Trifluoroethane		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1,2-Trichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloropropene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,3-Trichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,3-Trichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,4-Trichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,4-Trimethylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dibromo-3-chloropropane	0.0005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	
1,2-Dibromoethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3,5-Trimethylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,4-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,4-Dioxane		R	0.05 U	0.05 UJ	0.05 UJ	0.05 U	0.05 UJ	
2,2-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
2,4,4-Trimethyl-1-pentene	0.001 U *	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
2,4,4-Trimethyl-2-pentene	0.001 UJ	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
2-Butanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Chlorotoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
2-Hexanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	
4-Chlorotoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
4-iso-Propyltoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
4-Methyl-2-pentanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Acetic acid, methyl ester		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Acetone		0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U	
Benzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromochloromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromodichloromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 U	0.0005 U	
Bromoform	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Bromomethane	0.0005 U	0.002 UJ	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	

Table A-12
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Wilmington, Massachusetts

Parameter	M-24/L-63 OC-M24L63 10/7/2008	M-24/L-63 OC-M24L63 3/30/2010	M-24/L-63 OC-M24L63 8/4/2010	M-24/L-63 OC-M24L63 10/26/2010	M-24/L-63 OC-M24L63 12/16/2010	M-24/L-63 OC-M24L63 3/30/2011	M-24/L-63 OC-M24L63 7/12/2011	M-24/L-63 OC-M24L63 10/13/2011
Butane, 2-methoxy-2-methyl-		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 UJ	
Carbon disulfide		0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	
Carbon tetrachloride	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Chlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chlorodibromomethane	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
Chloroethane	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Chloroform	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chloromethane	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Cis-1,2-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
cis-1,3-Dichloropropene	0.0005 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	
Cyclohexane		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Dibromomethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Dichlorodifluoromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 UJ	0.001 U	
Diethyl ether		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Ethyl benzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Ethyl-t-Butyl Ether		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 UJ	
Hexachlorobutadiene	0.0005 U	0.0004 U	0.0004 U	0.0004 UJ	0.0004 U	0.0004 U	0.0004 U	
Isopropyl ether		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Isopropylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Methyl cyclohexane		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Methyl Tertbutyl Ether	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Methylene chloride	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Naphthalene	0.0005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	
n-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Propylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
sec-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Styrene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
tert-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Tetrachloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Tetrahydrofuran		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Toluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
trans-1,2-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
trans-1,3-Dichloropropene	0.0005 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	
Trichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Trichlorofluoromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Vinyl chloride	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 UJ	0.0005 U	0.0005 U	
Xylene, o	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Xylenes (m&p)	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	

Table A-12
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-63
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-63 OC-M24L63 10/7/2008	M-24/L-63 OC-M24L63 3/30/2010	M-24/L-63 OC-M24L63 8/4/2010	M-24/L-63 OC-M24L63 10/26/2010	M-24/L-63 OC-M24L63 12/16/2010	M-24/L-63 OC-M24L63 3/30/2011	M-24/L-63 OC-M24L63 7/12/2011	M-24/L-63 OC-M24L63 10/13/2011
Semivolatile Organics (mg/L)								
1,2,4,5-Tetrachlorobenzene		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
1-Methylnaphthalene		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
2,3,4,6-Tetrachlorophenol		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
2,4,5-Trichlorophenol		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
2,4,6-Trichlorophenol		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
2,4-Dichlorophenol		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
2,4-Dimethylphenol		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
2,4-Dinitrophenol		0.0046 UJ	0.0045 UJ	0.0045 U	R	0.0045 U	0.0045 U	0.0047 UJ
2,4-Dinitrotoluene		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
2,6-Dinitrotoluene		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
2-Chloronaphthalene		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
2-Chlorophenol		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
2-Methylnaphthalene		0.00092 U	0.00091 UJ	0.00091 U	0.0011 U	0.00091 U	0.00091 U	0.00094 UJ
2-Methylphenol		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
2-Nitroaniline		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
2-Nitrophenol		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
3 & 4 Methylphenol		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
3,3'-Dichlorobenzidine		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
3-Nitroaniline		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 UJ	0.0045 U	0.0047 UJ
4,6-Dinitro-2-methylphenol		0.0046 U	0.0045 UJ	0.0045 U	R	R	0.0045 U	0.0047 UJ
4-Bromophenyl phenyl ether		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
4-Chloro-3-methylphenol		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
4-Chloroaniline		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
4-Chlorophenyl phenyl ether		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
4-Nitroaniline		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
4-Nitrophenol		0.0046 UJ	0.0045 UJ	0.0045 UJ	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
Acenaphthene		0.00092 U	0.00091 UJ	0.00091 U	0.0011 U	0.00091 U	0.00091 U	0.00094 UJ
Acenaphthylene		0.00028 U	0.00027 UJ	0.00027 U	0.00032 U	0.00027 U	0.00027 U	0.00028 UJ
Acetophenone		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
Alachlor	0.00021 U							
Aniline		0.0046 U	0.0045 UJ	0.0045 UJ	0.0053 UJ	0.0045 UJ	0.0045 U	0.0047 UJ
Anthracene		0.00092 U	0.00091 UJ	0.00091 U	0.0011 U	0.00091 U	0.00091 U	0.00094 UJ
Atrazine	0.00021 U	0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
Azobenzene		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
Benzaldehyde		0.0046 U	0.0045 UJ	0.0045 UJ	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
Benzo(a)anthracene		0.00028 U	0.00027 UJ	0.00027 U	0.00032 U	0.00027 U	0.00027 U	0.00028 UJ
Benzo(a)pyrene	0.00021 U	0.00018 U	0.00018 UJ	0.00018 U	0.00021 U	0.00018 U	0.00018 U	0.00019 UJ
Benzo(b)fluoranthene		0.00028 U	0.00027 UJ	0.00027 U	0.00032 U	0.00027 U	0.00027 U	0.00028 UJ
Benzo(ghi)perylene		0.00046 U	0.00045 UJ	0.00045 U	0.00053 U	0.00045 U	0.00045 U	0.00047 UJ

Table A-12
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Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-63 OC-M24L63 10/7/2008	M-24/L-63 OC-M24L63 3/30/2010	M-24/L-63 OC-M24L63 8/4/2010	M-24/L-63 OC-M24L63 10/26/2010	M-24/L-63 OC-M24L63 12/16/2010	M-24/L-63 OC-M24L63 3/30/2011	M-24/L-63 OC-M24L63 7/12/2011	M-24/L-63 OC-M24L63 10/13/2011
Benzo(k)fluoranthene		0.00028 U	0.00027 UJ	0.00027 U	0.00032 U	0.00027 U	0.00027 U	0.00028 UJ
Benzoic Acid		0.0011 J	R	0.0045 UJ	0.0053 UJ	0.0045 UJ	0.0045 U	0.0047 UJ
Benzyl alcohol		0.0092 U	0.0091 UJ	0.0091 U	0.011 U	0.0091 U	0.0091 U	0.0094 UJ
Biphenyl		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
Bis(2-Chloroethoxy)methane		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
Bis(2-Chloroethyl)ether		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
Bis(2-Chloroisopropyl)ether		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
Bis(2-Ethylhexyl)phthalate	0.0021 U	0.0018 U	0.0018 UJ	0.0026 U	0.0021 UJ	0.0018 U	0.0018 U	0.0019 UJ
Butylbenzylphthalate		0.0046 U	0.0045 UJ	0.0045 U	0.00088 J	0.0045 U	0.0045 U	0.0047 UJ
Caprolactam		0.0046 UJ	0.0045 UJ	0.0045 UJ	0.0053 UJ	0.0045 UJ	0.0045 UJ	0.0047 UJ
Carbazole		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 UJ	0.0045 U	0.0047 UJ
Chrysene		0.00092 U	0.00091 UJ	0.00091 U	0.0011 U	0.00091 U	0.00091 U	0.00094 UJ
Di-2-ethylhexyladipate	0.0016 U							
Dibenz(a,h)anthracene		0.00046 U	0.00045 UJ	0.00045 U	0.00053 U	0.00045 U	0.00045 U	0.00047 UJ
Dibenzofuran		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
Diethylphthalate		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
Dimethylphthalate		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
Di-n-butylphthalate		0.0015 J	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
Di-n-octylphthalate		0.0046 U	0.0045 UJ	0.0045 U	0.0053 UJ	0.0045 U	0.0045 U	0.0047 UJ
Diphenyl ether		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
Diphenylmethanone		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
Endrin	0.00052 U							
Fluoranthene		0.00092 U	0.00091 UJ	0.00091 U	0.0011 U	0.00091 U	0.00091 U	0.00094 UJ
Fluorene		0.00092 U	0.00091 UJ	0.00091 U	0.00009 J	0.00091 U	0.00091 U	0.00094 UJ
Gamma-BHC/Lindane	0.00021 U							
Heptachlor	0.00021 U							
Heptachlor epoxide	0.00021 U							
Hexachlorobenzene	0.00021 U	0.00092 U	0.00091 UJ	0.00091 U	0.0011 U	0.00091 U	0.00091 U	0.00094 UJ
Hexachlorocyclopentadiene	0.0021 U	0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
Hexachloroethane		0.0028 U	0.0027 UJ	0.0027 U	0.0032 U	0.0027 U	0.0027 UJ	0.0028 UJ
Indeno(1,2,3-cd)pyrene		0.00046 U	0.00045 UJ	0.00045 U	0.000093 J	0.00045 U	0.00045 U	0.00047 UJ
Isophorone		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
Methoxychlor	0.00052 U							
Nitrobenzene		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
N-Nitrosodi-n-propylamine		0.0000097 U	0.0000096 U	0.000002 U	0.0000019 U	0.0000019 U	0.0000019 U	0.0000019 U
N-Nitrosodiphenylamine		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ
Pentachlorophenol		0.00092 U	0.00091 UJ	0.00091 U	R	0.00091 U	0.00091 U	0.00094 UJ
Phenanthrene		0.00018 U	0.00018 UJ	0.00018 U	0.00021 U	0.00018 U	0.00018 U	0.00019 UJ
Phenol		0.0046 UJ	0.0045 UJ	0.0045 U	0.0053 UJ	0.0045 UJ	0.0045 U	0.0047 UJ
Pyrene		0.0046 U	0.0045 UJ	0.0045 U	0.0053 U	0.0045 U	0.0045 U	0.0047 UJ

Table A-12
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-63
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-63 OC-M24L63 10/7/2008	M-24/L-63 OC-M24L63 3/30/2010	M-24/L-63 OC-M24L63 8/4/2010	M-24/L-63 OC-M24L63 10/26/2010	M-24/L-63 OC-M24L63 12/16/2010	M-24/L-63 OC-M24L63 3/30/2011	M-24/L-63 OC-M24L63 7/12/2011	M-24/L-63 OC-M24L63 10/13/2011
Simazine	0.00052 U							
NDMA (mg/L)								
N-Nitrosodimethylamine	0.000002 U	0.0000019 U	0.0000019 U	0.000002 UJ	0.0000012 J	0.0000019 U	0.0000019 U	0.0000019 U
Metals, Total (mg/L)								
Calcium	98	92	77	86	87	93	94	
Chromium	0.005 U	0.005 U	0.005 U	0.005 U	0.0014 J	0.005 U	0.00087 J	0.005 U
Sodium	28	28	22	24	25	28	29	28
Chromium, Hexavalent								0.001 UJ
Inorganics (mg/L)								
Chloride	160	150	130	160	140	160	160	160
Nitrate as N	0.34	0.39	0.33	0.38	0.39	0.32	0.38	0.39
Nitrite as N	0.01 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nitrogen, as Ammonia	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U
Sulfate	18	18	20	20	21	17	16	18
Specialty Compounds (mg/L)								
Hydrazine		0.0002 U	0.000069 J	0.0001 U	0.0001 U	0.0001 U	0.0001 U	
Monomethylhydrazine (MMH)		0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
UDMH		0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
Acetaldehyde		0.03 U	0.03 U	0.03 U	0.75 U	0.03 U	0.03 U	
Formaldehyde		0.03 U	0.03 U	0.03 U	0.75 U	0.03 U	0.03 U	
Phthalic Acid/Phthalic anhydride		0.01 U						

mg/L = milligram per liter

Prepared by / Date: KJC 03/27/12

Checked by / Date: BJR 03/29/12

U = not detected, value is the reporting limit

J = value is estimated

R = value is rejected

Table A-13
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-64
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-64 OC-M24L64 1/20/2009	M-24/L-64 OC-M24L64 7/8/2010	M-24/L-64 OC-M24L64 8/4/2010	M-24/L-64 OC-M24L64 11/9/2010	M-24/L-64 OC-M24L64 12/17/2010	M-24/L-64 OC-M24L64 3/30/2011	M-24/L-64 OC-M24L64 7/12/2011	M-24/L-64 OC-M24L64 10/13/2011
Volatile Organics (mg/L)								
1,1,1,2-Tetrachloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1,1-Trichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
1,1,2,2-Tetrachloroethane	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
1,1,2-Trichloro-1,2,2-Trifluoroethane		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1,2-Trichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloropropene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,3-Trichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,3-Trichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,4-Trichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,4-Trimethylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dibromo-3-chloropropane	0.0005 U	0.005 U	0.005 U	0.005 UJ	0.005 U	0.005 U	0.005 U	
1,2-Dibromoethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3,5-Trimethylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,4-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,4-Dioxane		0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 U	0.05 UJ	
2,2-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	0.001 U	
2,4,4-Trimethyl-1-pentene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
2,4,4-Trimethyl-2-pentene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
2-Butanone		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Chlorotoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
2-Hexanone		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U
4-Chlorotoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
4-iso-Propyltoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
4-Methyl-2-pentanone		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Acetic acid, methyl ester		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Acetone		0.05 U	0.05 UJ	0.05 U	0.05 UJ	0.05 UJ	0.05 U	
Benzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromochloromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromodichloromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 U	0.0005 U	
Bromoform	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Bromomethane	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	

Table A-13
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-64
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-64 OC-M24L64 1/20/2009	M-24/L-64 OC-M24L64 7/8/2010	M-24/L-64 OC-M24L64 8/4/2010	M-24/L-64 OC-M24L64 11/9/2010	M-24/L-64 OC-M24L64 12/17/2010	M-24/L-64 OC-M24L64 3/30/2011	M-24/L-64 OC-M24L64 7/12/2011	M-24/L-64 OC-M24L64 10/13/2011
Butane, 2-methoxy-2-methyl-		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 UJ	
Carbon disulfide		0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	
Carbon tetrachloride	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Chlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chlorodibromomethane	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
Chloroethane	0.0005 UJ	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Chloroform	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chloromethane	0.0005 UJ	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Cis-1,2-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
cis-1,3-Dichloropropene	0.0005 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	
Cyclohexane		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Dibromomethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Dichlorodifluoromethane	0.0005 UJ	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 UJ	0.001 U	
Diethyl ether		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Ethyl benzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Ethyl-t-Butyl Ether		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 UJ	
Hexachlorobutadiene	0.0005 U	0.0004 U	0.0004 U	0.0004 UJ	0.0004 U	0.0004 U	0.0004 U	
Isopropyl ether		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Isopropylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Methyl cyclohexane		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Methyl Tertbutyl Ether	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Methylene chloride	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Naphthalene	0.0005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	
n-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Propylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
sec-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Styrene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
tert-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Tetrachloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Tetrahydrofuran		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Toluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
trans-1,2-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
trans-1,3-Dichloropropene	0.0005 U	0.0004 U	0.0004 U	0.0004 UJ	0.0004 U	0.0004 U	0.0004 U	
Trichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Trichlorofluoromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Vinyl chloride	0.0005 UJ	0.0005 U	0.0005 U	0.0005 U	0.0005 UJ	0.0005 U	0.0005 U	
Xylene, o	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Xylenes (m&p)	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	

Table A-13
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-64
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-64 OC-M24L64 1/20/2009	M-24/L-64 OC-M24L64 7/8/2010	M-24/L-64 OC-M24L64 8/4/2010	M-24/L-64 OC-M24L64 11/9/2010	M-24/L-64 OC-M24L64 12/17/2010	M-24/L-64 OC-M24L64 3/30/2011	M-24/L-64 OC-M24L64 7/12/2011	M-24/L-64 OC-M24L64 10/13/2011
Semivolatile Organics (mg/L)								
1,2,4,5-Tetrachlorobenzene		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
1-Methylnaphthalene		0.00015 J	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
2,3,4,6-Tetrachlorophenol		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
2,4,5-Trichlorophenol		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
2,4,6-Trichlorophenol		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
2,4-Dichlorophenol		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
2,4-Dimethylphenol		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
2,4-Dinitrophenol		0.0047 UJ	0.0045 UJ	0.0045 U	R	0.0045 U	0.0045 U	0.0048 UJ
2,4-Dinitrotoluene		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
2,6-Dinitrotoluene		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
2-Choronaphthalene		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
2-Chlorophenol		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
2-Methylnaphthalene		0.00032 J	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00096 UJ
2-Methylphenol		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
2-Nitroaniline		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
2-Nitrophenol		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
3 & 4 Methylphenol		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
3,3'-Dichlorobenzidine		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
3-Nitroaniline		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	0.0048 UJ
4,6-Dinitro-2-methylphenol		0.0047 UJ	0.0045 UJ	0.0045 U	R	R	0.0045 U	0.0048 UJ
4-Bromophenyl phenyl ether		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
4-Chloro-3-methylphenol		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
4-Chloroaniline		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
4-Chlorophenyl phenyl ether		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
4-Nitroaniline		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
4-Nitrophenol		0.0047 UJ	0.0045 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
Acenaphthene		0.00093 UJ	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00096 UJ
Acenaphthylene		0.00028 UJ	0.00027 UJ	0.00027 U	0.00027 U	0.00027 U	0.00027 U	0.00029 UJ
Acetophenone		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
Alachlor	0.0002 U							
Aniline		0.0047 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 U	0.0048 UJ
Anthracene		0.00093 UJ	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00096 UJ
Atrazine	0.0002 U	0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
Azobenzene		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
Benzaldehyde		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
Benzo(a)anthracene		0.00028 UJ	0.00027 UJ	0.00027 U	0.00027 U	0.00027 U	0.00027 U	0.00029 UJ
Benzo(a)pyrene	0.0002 U	0.00019 UJ	0.00018 UJ	0.00018 U	0.00018 U	0.00018 U	0.00018 U	0.00019 UJ
Benzo(b)fluoranthene		0.00028 UJ	0.00027 UJ	0.00027 U	0.00027 U	0.00027 U	0.00027 U	0.00029 UJ
Benzo(ghi)perylene		0.00047 UJ	0.00045 UJ	0.00017 J	0.00045 U	0.00045 U	0.00045 U	0.00048 UJ

Table A-13
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Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-64 OC-M24L64 1/20/2009	M-24/L-64 OC-M24L64 7/8/2010	M-24/L-64 OC-M24L64 8/4/2010	M-24/L-64 OC-M24L64 11/9/2010	M-24/L-64 OC-M24L64 12/17/2010	M-24/L-64 OC-M24L64 3/30/2011	M-24/L-64 OC-M24L64 7/12/2011	M-24/L-64 OC-M24L64 10/13/2011
Benzo(k)fluoranthene		0.00021 J	0.00027 UJ	0.00027 U	0.00027 U	0.00027 U	0.00027 U	0.00029 UJ
Benzoic Acid		0.0047 UJ	R	0.0045 U	0.0045 UJ	0.0045 UJ	0.0045 U	0.0048 UJ
Benzyl alcohol		0.0093 UJ	0.0091 UJ	0.0091 U	0.0091 U	0.0091 U	0.0091 U	0.0096 UJ
Biphenyl		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
Bis(2-Chloroethoxy)methane		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
Bis(2-Chloroethyl)ether		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
Bis(2-Chloroisopropyl)ether		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
Bis(2-Ethylhexyl)phthalate	0.002 U	0.0019 UJ	0.0018 UJ	0.0018 U	0.0018 UJ	0.00059 J	0.0018 U	0.0019 UJ
Butylbenzylphthalate		0.00057 J	0.0045 UJ	0.0045 U	0.0045 U	0.00068 J	0.0045 U	0.0048 UJ
Caprolactam		0.0047 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0048 UJ
Carbazole		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	0.0048 UJ
Chrysene		0.00093 UJ	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00096 UJ
Di-2-ethylhexyladipate	0.0015 U							
Dibenz(a,h)anthracene		0.00047 UJ	0.00045 UJ	0.00018 J	0.00045 U	0.00045 U	0.00045 U	0.00048 UJ
Dibenzo furan		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
Diethylphthalate		0.0047 UJ	0.0045 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
Dimethylphthalate		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
Di-n-butylphthalate		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0009 J	0.0045 U	0.0048 UJ
Di-n-octylphthalate		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0048 UJ
Diphenyl ether		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
Diphenylmethanone		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
Endrin	0.00051 U							
Fluoranthene		0.00093 UJ	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00096 UJ
Fluorene		0.000088 J	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00096 UJ
Gamma-BHC/Lindane	0.0002 U							
Heptachlor	0.0002 U							
Heptachlor epoxide	0.0002 U							
Hexachlorobenzene	0.0002 U	0.00093 UJ	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00096 UJ
Hexachlorocyclopentadiene	0.002 U	0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
Hexachloroethane		0.0028 UJ	0.0027 UJ	0.0027 U	0.0027 U	0.0027 U	0.0027 UJ	0.0029 UJ
Indeno(1,2,3-cd)pyrene		0.00047 UJ	0.00045 UJ	0.00018 J	0.00045 U	0.00045 U	0.00045 U	0.00048 UJ
Isophorone		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
Methoxychlor	0.00051 UJ							
Nitrobenzene		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
N-Nitrosodi-n-propylamine		0.0000098 UJ	0.0000095 U	0.0000019 U	0.000002 U	0.0000019 U	0.0000019 U	0.0000019 U
N-Nitrosodiphenylamine		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ
Pentachlorophenol		0.00093 UJ	0.00091 UJ	0.00091 U	R	0.00091 U	0.00091 U	0.00096 UJ
Phenanthrene		0.00019 UJ	0.00018 UJ	0.00018 U	0.00018 U	0.00018 U	0.00018 U	0.00019 UJ
Phenol		0.0047 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 U	0.0048 UJ
Pyrene		0.0047 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0048 UJ

Table A-13
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-64
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-64 OC-M24L64 1/20/2009	M-24/L-64 OC-M24L64 7/8/2010	M-24/L-64 OC-M24L64 8/4/2010	M-24/L-64 OC-M24L64 11/9/2010	M-24/L-64 OC-M24L64 12/17/2010	M-24/L-64 OC-M24L64 3/30/2011	M-24/L-64 OC-M24L64 7/12/2011	M-24/L-64 OC-M24L64 10/13/2011
Simazine	0.00051 U							
NDMA (mg/L)								
N-Nitrosodimethylamine	0.000002 U	0.000002 UJ	0.0000019 U	0.0000019 U	0.00000054 J	0.0000019 U	0.0000019 U	0.0000019 U
Metals, Total (mg/L)								
Calcium	84	71 J	72	80	81	77	79	
Chromium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.0013 J	0.005 U
Sodium	24	19	21	22	23	23	21	22
Chromium, Hexavalent								0.001 UJ
Inorganics (mg/L)								
Chloride	120	120	130	150	130	130	140	140
Nitrate as N	0.51	0.33	0.33	0.63	1.2	0.6	0.55	0.56
Nitrite as N	0.012	0.1 U	0.1 U	0.01 U	0.01 U	0.1 U	0.1 U	0.01 U
Nitrogen, as Ammonia	0.1 U	0.1 U	0.1 U	0.22	0.1 UJ	0.1 U	0.1 U	0.1 U
Sulfate	18	19	19	21	21	17	16	18
Specialty Compounds (mg/L)								
Hydrazine	0.0002 U	0.0002 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U		
Monomethylhydrazine (MMH)	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U		
UDMH	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U		
Acetaldehyde	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U		
Formaldehyde	0.03 U	0.0053 J	0.03 U	0.03 U	0.03 U	0.03 U		
Phthalic Acid/Phthalic anhydride	0.01 U							

mg/L = milligram per liter

Prepared by / Date: KJC 03/27/12

Checked by / Date: BJR 03/29/12

U = not detected, value is the reporting limit

J = value is estimated

R = value is rejected

Table A-14
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-65
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-65 OC-M24L65 3/31/2011	M-24/L-65 OC-M24L65 7/12/2011	M-24/L-65 OC-M24L65 10/12/2011
Volatile Organics (mg/L)			
1,1,1,2-Tetrachloroethane	0.001 U	0.001 U	
1,1,1-Trichloroethane	0.001 U	0.001 U	
1,1,2,2-Tetrachloroethane	0.0005 U	0.0005 U	
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.001 U	0.001 U	
1,1,2-Trichloroethane	0.001 U	0.001 U	
1,1-Dichloroethane	0.001 U	0.001 U	
1,1-Dichloroethene	0.001 U	0.001 U	
1,1-Dichloropropene	0.001 U	0.001 U	
1,2,3-Trichlorobenzene	0.001 U	0.001 U	
1,2,3-Trichloropropane	0.001 U	0.001 U	
1,2,4-Trichlorobenzene	0.001 U	0.001 U	
1,2,4-Trimethylbenzene	0.001 U	0.001 U	
1,2-Dibromo-3-chloropropane	0.005 U	0.005 U	
1,2-Dibromoethane	0.001 U	0.001 U	
1,2-Dichlorobenzene	0.001 U	0.001 U	
1,2-Dichloroethane	0.001 U	0.001 U	
1,2-Dichloropropane	0.001 U	0.001 U	
1,3,5-Trimethylbenzene	0.001 U	0.001 U	
1,3-Dichlorobenzene	0.001 U	0.001 U	
1,3-Dichloropropane	0.001 U	0.001 U	
1,4-Dichlorobenzene	0.001 U	0.001 U	
1,4-Dioxane	0.05 U	0.05 UJ	
2,2-Dichloropropane	0.001 U	0.001 U	
2,4,4-Trimethyl-1-pentene	0.001 U	0.001 U	
2,4,4-Trimethyl-2-pentene	0.001 U	0.001 U	
2-Butanone	0.01 U	0.01 U	
2-Chlorotoluene	0.001 U	0.001 U	
2-Hexanone	0.01 UJ	0.01 U	
4-Chlorotoluene	0.001 U	0.001 U	
4-iso-Propyltoluene	0.001 U	0.001 U	
4-Methyl-2-pentanone	0.01 U	0.01 U	
Acetic acid, methyl ester	0.02 U	0.02 U	
Acetone	0.05 UJ	0.05 U	
Benzene	0.001 U	0.001 U	
Bromobenzene	0.001 U	0.001 U	
Bromochloromethane	0.001 U	0.001 U	
Bromodichloromethane	0.0005 U	0.0005 U	
Bromoform	0.001 U	0.001 U	
Bromomethane	0.002 U	0.002 U	

Table A-14
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-65
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Parameter	M-24/L-65 OC-M24L65 3/31/2011	M-24/L-65 OC-M24L65 7/12/2011	M-24/L-65 OC-M24L65 10/12/2011
Butane, 2-methoxy-2-methyl-	0.005 U	0.005 UJ	
Carbon disulfide	0.01 U	0.01 U	
Carbon tetrachloride	0.001 U	0.001 U	
Chlorobenzene	0.001 U	0.001 U	
Chlorodibromomethane	0.0005 U	0.0005 U	
Chloroethane	0.002 U	0.002 U	
Chloroform	0.001 U	0.001 U	
Chloromethane	0.002 U	0.002 U	
Cis-1,2-Dichloroethene	0.001 U	0.001 U	
cis-1,3-Dichloropropene	0.0004 U	0.0004 U	
Cyclohexane	0.01 U	0.01 U	
Dibromomethane	0.001 U	0.001 U	
Dichlorodifluoromethane	0.001 UJ	0.001 U	
Diethyl ether	0.01 U	0.01 U	
Ethyl benzene	0.001 U	0.001 U	
Ethyl-t-Butyl Ether	0.005 U	0.005 UJ	
Hexachlorobutadiene	0.0004 U	0.0004 U	
Isopropyl ether	0.01 U	0.01 U	
Isopropylbenzene	0.001 U	0.001 U	
Methyl cyclohexane	0.01 U	0.01 U	
Methyl Tertbutyl Ether	0.001 U	0.001 U	
Methylene chloride	0.002 U	0.002 U	
Naphthalene	0.005 U	0.005 U	
n-Butylbenzene	0.001 U	0.001 U	
Propylbenzene	0.001 U	0.001 U	
sec-Butylbenzene	0.001 U	0.001 U	
Styrene	0.001 U	0.001 U	
tert-Butylbenzene	0.001 U	0.001 U	
Tetrachloroethene	0.001 U	0.001 U	
Tetrahydrofuran	0.01 U	0.01 U	
Toluene	0.001 U	0.001 U	
trans-1,2-Dichloroethene	0.001 U	0.001 U	
trans-1,3-Dichloropropene	0.0004 U	0.0004 U	
Trichloroethene	0.001 U	0.001 U	
Trichlorofluoromethane	0.001 U	0.001 U	
Vinyl chloride	0.0005 U	0.0005 U	
Xylene, o	0.001 U	0.001 U	
Xylenes (m&p)	0.002 U	0.002 U	

Table A-14
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-65
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Parameter	M-24/L-65 OC-M24L65 3/31/2011	M-24/L-65 OC-M24L65 7/12/2011	M-24/L-65 OC-M24L65 10/12/2011
Semivolatile Organics (mg/L)			
1,2,4,5-Tetrachlorobenzene	0.0045 U	0.0045 U	
1-Methylnaphthalene	0.0045 U	0.0045 U	
2,3,4,6-Tetrachlorophenol	0.0045 U	0.0045 U	
2,4,5-Trichlorophenol	0.0045 U	0.0045 U	
2,4,6-Trichlorophenol	0.0045 U	0.0045 U	
2,4-Dichlorophenol	0.0045 U	0.0045 U	
2,4-Dimethylphenol	0.0045 U	0.0045 U	
2,4-Dinitrophenol	0.0045 U	0.0045 U	
2,4-Dinitrotoluene	0.0045 U	0.0045 U	
2,6-Dinitrotoluene	0.0045 U	0.0045 U	
2-Chloronaphthalene	0.0045 U	0.0045 U	
2-Chlorophenol	0.0045 U	0.0045 U	
2-Methylnaphthalene	0.00091 U	0.00091 U	
2-Methylphenol	0.0045 U	0.0045 U	
2-Nitroaniline	0.0045 U	0.0045 U	
2-Nitrophenol	0.0045 U	0.0045 U	
3 & 4 Methylphenol	0.0045 U	0.0045 U	
3,3' -Dichlorobenzidine	0.0045 U	0.0045 U	
3-Nitroaniline	0.0045 UJ	0.0045 U	
4,6-Dinitro-2-methylphenol	R	0.0045 U	
4-Bromophenyl phenyl ether	0.0045 U	0.0045 U	
4-Chloro-3-methylphenol	0.0045 U	0.0045 U	
4-Chloroaniline	0.0045 U	0.0045 U	
4-Chlorophenyl phenyl ether	0.0045 U	0.0045 U	
4-Nitroaniline	0.0045 U	0.0045 U	
4-Nitrophenol	0.0045 U	0.00076 J	
Acenaphthene	0.00091 U	0.00091 U	
Acenaphthylene	0.00027 U	0.00027 U	
Acetophenone	0.0045 U	0.0045 U	
Aniline	0.0045 UJ	0.0045 U	
Anthracene	0.00091 U	0.00091 U	
Atrazine	0.0045 U	0.0045 U	
Azobenzene	0.0045 U	0.0045 U	
Benzaldehyde	0.0045 U	0.0045 U	
Benzo(a)anthracene	0.00027 U	0.00027 U	
Benzo(a)pyrene	0.00018 U	0.00018 U	
Benzo(b)fluoranthene	0.00027 U	0.00027 U	
Benzo(ghi)perylene	0.00045 U	0.00045 U	
Benzo(k)fluoranthene	0.00027 U	0.00027 U	

Table A-14
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Parameter	M-24/L-65 OC-M24L65 3/31/2011	M-24/L-65 OC-M24L65 7/12/2011	M-24/L-65 OC-M24L65 10/12/2011
Benzoic Acid	0.0045 UJ	0.0045 U	
Benzyl alcohol	0.0091 U	0.0091 U	
Biphenyl	0.0045 U	0.0045 U	
Bis(2-Chloroethoxy)methane	0.0045 U	0.0045 U	
Bis(2-Chloroethyl)ether	0.0045 U	0.0045 U	
Bis(2-Chloroisopropyl)ether	0.0045 U	0.0045 U	
Bis(2-Ethylhexyl)phthalate	0.0018 U	0.0018 U	
Butylbenzylphthalate	0.0045 U	0.0045 U	
Caprolactam	0.0045 UJ	0.0045 UJ	
Carbazole	0.0045 UJ	0.0045 U	
Chrysene	0.00091 U	0.00091 U	
Dibenz(a,h)anthracene	0.00045 U	0.00045 U	
Dibenzofuran	0.0045 U	0.0045 U	
Diethylphthalate	0.0045 U	0.0045 U	
Dimethylphthalate	0.0045 U	0.0045 U	
Di-n-butylphthalate	0.0045 U	0.0045 U	
Di-n-octylphthalate	0.0045 U	0.0045 U	
Diphenyl ether	0.0045 U	0.0045 U	
Diphenylmethanone	0.0045 U	0.0045 U	
Fluoranthene	0.00091 U	0.00091 U	
Fluorene	0.00091 U	0.00091 U	
Hexachlorobenzene	0.00091 U	0.00091 U	
Hexachlorocyclopentadiene	0.0045 U	0.0045 U	
Hexachloroethane	0.0027 U	0.0027 UJ	
Indeno(1,2,3-cd)pyrene	0.00045 U	0.00045 U	
Isophorone	0.0045 U	0.0045 U	
Nitrobenzene	0.0045 U	0.0045 U	
N-Nitrosodi-n-propylamine	0.0000019 U	0.0000019 U	0.0000019 U
N-Nitrosodiphenylamine	0.0045 U	0.0045 U	
Pentachlorophenol	0.00091 U	0.00091 U	
Phenanthrene	0.00018 U	0.00018 U	
Phenol	0.0045 UJ	0.0045 U	
Pyrene	0.0045 U	0.0045 U	
NDMA (mg/L)			
N-Nitrosodimethylamine	0.0000019 U	0.0000019 U	0.0000019 U
Metals, Total (mg/L)			
Calcium	71	79	
Chromium	0.005 U	0.005 U	0.005 U
Sodium	15	17	15

Table A-14
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Parameter	M-24/L-65 OC-M24L65 3/31/2011	M-24/L-65 OC-M24L65 7/12/2011	M-24/L-65 OC-M24L65 10/12/2011
Inorganics (mg/L)			
Chloride	80	99	97
Nitrate as N	0.49	0.6	0.57
Nitrite as N	0.1 U	0.1 U	0.1 UJ
Nitrogen, as Ammonia	0.1 U	0.1 U	0.1 U
Sulfate	20	20	20
Specialty Compounds (mg/L)			
Hydrazine	0.0001 U	0.0001 U	
Monomethylhydrazine (MMH)	0.0005 U	0.0005 U	
UDMH	0.0005 U	0.0005 U	
Acetaldehyde	0.03 U	0.03 U	
Formaldehyde	0.03 U	0.03 U	

mg/L = milligram per liter

Prepared by / Date: KJC 03/27/12

Checked by / Date: BJR 03/29/12

U = not detected, value is the reporting limit

J = value is estimated

R = value is rejected

Table A-15
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-66
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Parameter	M-24/L-66 OC-M24L66 12/5/2008	M-24/L-66 OC-M24L66 3/30/2010	M-24/L-66 OC-M24L66 8/23/2010	M-24/L-66 OC-M24L66 11/5/2010	M-24/L-66 OC-M24L66 12/16/2010	M-24/L-66 OC-M24L66 3/31/2011	M-24/L-66 OC-M24L66 7/12/2011	M-24/L-66 OC-M24L66 10/13/2011
Volatile Organics (mg/L)								
1,1,1,2-Tetrachloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1,1-Trichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
1,1,2,2-Tetrachloroethane	0.0005 U	0.0005 U	0.0005 U					
1,1,2-Trichloro-1,2,2-Trifluoroethane		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1,2-Trichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloroethene	0.0005 UJ	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloropropene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,3-Trichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,3-Trichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,4-Trichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,4-Trimethylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dibromo-3-chloropropane	0.0005 UJ	0.005 U	0.005 U	0.005 UJ	0.005 U	0.005 U	0.005 U	
1,2-Dibromoethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3,5-Trimethylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,4-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,4-Dioxane		R	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U	0.05 UJ	
2,2-Dichloropropane	0.0005 U	0.001 U	0.001 UJ	0.001 UJ	0.001 U	0.001 U	0.001 U	
2,4,4-Trimethyl-1-pentene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
2,4,4-Trimethyl-2-pentene	0.001 UJ	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
2-Butanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Chlorotoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
2-Hexanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	
4-Chlorotoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
4-iso-Propyltoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
4-Methyl-2-pentanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Acetic acid, methyl ester		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Acetone		0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 U	
Benzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromochloromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromodichloromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 U	0.0005 U	
Bromoform	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Bromomethane	0.0005 U	0.002 UJ	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	

Table A-15
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Parameter	M-24/L-66 OC-M24L66 12/5/2008	M-24/L-66 OC-M24L66 3/30/2010	M-24/L-66 OC-M24L66 8/23/2010	M-24/L-66 OC-M24L66 11/5/2010	M-24/L-66 OC-M24L66 12/16/2010	M-24/L-66 OC-M24L66 3/31/2011	M-24/L-66 OC-M24L66 7/12/2011	M-24/L-66 OC-M24L66 10/13/2011
Butane, 2-methoxy-2-methyl-		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 UJ	
Carbon disulfide		0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	
Carbon tetrachloride	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Chlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chlorodibromomethane	0.0005 U	0.0005 U	0.0005 U					
Chloroethane	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Chloroform	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chloromethane	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Cis-1,2-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
cis-1,3-Dichloropropene	0.0005 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	
Cyclohexane		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Dibromomethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Dichlorodifluoromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 UJ	0.001 U	
Diethyl ether		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Ethyl benzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Ethyl-t-Butyl Ether		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 UJ	
Hexachlorobutadiene	0.0005 U	0.0004 U	0.0004 U	0.0004 UJ	0.0004 U	0.0004 U	0.0004 U	
Isopropyl ether		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Isopropylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Methyl cyclohexane		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Methyl Tertbutyl Ether	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Methylene chloride	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Naphthalene	0.0005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	
n-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Propylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
sec-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Styrene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
tert-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Tetrachloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Tetrahydrofuran		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Toluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
trans-1,2-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
trans-1,3-Dichloropropene	0.0005 U	0.0004 U	0.0004 U	0.0004 UJ	0.0004 U	0.0004 U	0.0004 U	
Trichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Trichlorofluoromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Vinyl chloride	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 UJ	0.0005 U	0.0005 U	
Xylene, o	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Xylenes (m&p)	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	

Table A-15
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Parameter	M-24/L-66 OC-M24L66 12/5/2008	M-24/L-66 OC-M24L66 3/30/2010	M-24/L-66 OC-M24L66 8/23/2010	M-24/L-66 OC-M24L66 11/5/2010	M-24/L-66 OC-M24L66 12/16/2010	M-24/L-66 OC-M24L66 3/31/2011	M-24/L-66 OC-M24L66 7/12/2011	M-24/L-66 OC-M24L66 10/13/2011
Semivolatile Organics (mg/L)								
1,2,4,5-Tetrachlorobenzene		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
1-Methylnaphthalene		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
2,3,4,6-Tetrachlorophenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
2,4,5-Trichlorophenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
2,4,6-Trichlorophenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
2,4-Dichlorophenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
2,4-Dimethylphenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
2,4-Dinitrophenol		0.0046 UJ	0.0045 U	0.0045 UJ	R	0.0045 UJ	0.0045 U	
2,4-Dinitrotoluene		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
2,6-Dinitrotoluene		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
2-Choronaphthalene		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
2-Chlorophenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
2-Methylnaphthalene		0.00092 U	0.00091 U	0.00091 U	0.00091 U	0.00091 UJ	0.00091 U	
2-Methylphenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
2-Nitroaniline		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
2-Nitrophenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
3 & 4 Methylphenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
3,3'-Dichlorobenzidine		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
3-Nitroaniline		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
4,6-Dinitro-2-methylphenol		0.0046 U	0.0045 U	0.0045 UJ	R	R	0.0045 U	
4-Bromophenyl phenyl ether		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
4-Chloro-3-methylphenol		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
4-Chloroaniline		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
4-Chlorophenyl phenyl ether		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
4-Nitroaniline		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
4-Nitrophenol		0.0046 UJ	0.0045 U	0.0045 UJ	0.0045 U	0.0045 UJ	0.0045 U	
Acenaphthene		0.00092 U	0.00091 U	0.00091 U	0.00091 U	0.00091 UJ	0.00091 U	
Acenaphthylene		0.00028 U	0.00027 U	0.00027 U	0.00027 U	0.00027 UJ	0.00027 U	
Acetophenone		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
Alachlor	0.0002 U							
Aniline		0.0046 U	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 U	
Anthracene		0.00092 U	0.00091 U	0.00091 U	0.00091 U	0.00091 UJ	0.00091 U	
Atrazine	0.0002 U	0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
Azobenzene		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
Benzaldehyde		0.0046 U	0.0045 U	0.0045 UJ	0.0045 U	0.0045 UJ	0.0045 U	
Benzo(a)anthracene		0.00028 U	0.00027 U	0.00027 U	0.00027 U	0.00027 UJ	0.00027 U	
Benzo(a)pyrene	0.0002 U	0.00018 U	0.00018 U	0.00018 U	0.00018 U	0.00018 UJ	0.00018 U	
Benzo(b)fluoranthene		0.00028 U	0.00013 J	0.00027 U	0.00027 U	0.00027 UJ	0.00027 U	
Benzo(ghi)perylene		0.00046 U	0.00045 U	0.00045 U	0.00045 U	0.00045 UJ	0.00045 U	

Table A-15
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-66
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-66 OC-M24L66 12/5/2008	M-24/L-66 OC-M24L66 3/30/2010	M-24/L-66 OC-M24L66 8/23/2010	M-24/L-66 OC-M24L66 11/5/2010	M-24/L-66 OC-M24L66 12/16/2010	M-24/L-66 OC-M24L66 3/31/2011	M-24/L-66 OC-M24L66 7/12/2011	M-24/L-66 OC-M24L66 10/13/2011
Benzo(k)fluoranthene		0.00028 U	0.00027 U	0.00027 U	0.00027 U	0.00027 UJ	0.00027 U	
Benzoic Acid		0.0012 J	R	0.0045 U	0.0045 UJ	0.0045 UJ	0.0045 U	
Benzyl alcohol		0.0092 U	0.0091 U	0.0091 U	0.0091 U	0.0091 UJ	0.0091 U	
Biphenyl		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
Bis(2-Chloroethoxy)methane		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
Bis(2-Chloroethyl)ether		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
Bis(2-Chloroisopropyl)ether		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
Bis(2-Ethylhexyl)phthalate	0.002 U	0.0018 U	0.0018 U	0.0018 U	0.0018 UJ	0.0018 UJ	0.0018 U	
Butylbenzylphthalate		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
Caprolactam		0.0046 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	R	0.0045 UJ	
Carbazole		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
Chrysene		0.00092 U	0.00021 J	0.00091 U	0.00091 U	0.00091 UJ	0.00091 U	
Di-2-ethylhexyladipate	0.0015 U							
Dibenz(a,h)anthracene		0.00046 U	0.00045 U	0.00045 U	0.00045 U	0.00045 UJ	0.00045 U	
Dibenzofuran		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
Diethylphthalate		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
Dimethylphthalate		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
Di-n-butylphthalate		0.0015 J	0.0045 U	0.00083 J	0.0045 U	0.0045 UJ	0.0045 U	
Di-n-octylphthalate		0.0046 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 UJ	0.0045 U	
Diphenyl ether		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
Diphenylmethanone		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
Endrin	0.00051 U							
Fluoranthene		0.00092 U	0.00091 U	0.00091 U	0.00091 U	0.00091 UJ	0.00091 U	
Fluorene		0.00092 U	0.00091 U	0.00091 U	0.00091 U	0.00091 UJ	0.00091 U	
Gamma-BHC/Lindane	0.0002 U							
Heptachlor	0.0002 U							
Heptachlor epoxide	0.0002 U							
Hexachlorobenzene	0.0002 U	0.00092 U	0.00091 U	0.00091 U	0.00091 U	0.00091 UJ	0.00091 U	
Hexachlorocyclopentadiene	0.002 U	0.0046 U	0.0045 U	0.0045 UJ	0.0045 U	0.0045 UJ	0.0045 U	
Hexachloroethane		0.0028 U	0.0027 U	0.0027 U	0.0027 U	0.0027 UJ	0.0027 UJ	
Indeno(1,2,3-cd)pyrene		0.00046 U	0.00045 U	0.00045 U	0.00045 U	0.00045 UJ	0.00045 U	
Isophorone		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
Methoxychlor	0.00051 U							
Nitrobenzene		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
N-Nitrosodi-n-propylamine		0.0000096 U	0.0000096 U	0.0000053	0.000002 U	0.0000019 U	0.000002 U	0.0000019 U
N-Nitrosodiphenylamine		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
Pentachlorophenol		0.00092 U	0.00091 U	0.00091 U	R	R	0.00091 U	
Phenanthrene		0.00018 U	0.000077 J	0.00018 U	0.00018 U	0.00018 UJ	0.00018 U	
Phenol		0.0046 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 U	
Pyrene		0.0046 U	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	

Table A-15
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-66
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-66 OC-M24L66 12/5/2008	M-24/L-66 OC-M24L66 3/30/2010	M-24/L-66 OC-M24L66 8/23/2010	M-24/L-66 OC-M24L66 11/5/2010	M-24/L-66 OC-M24L66 12/16/2010	M-24/L-66 OC-M24L66 3/31/2011	M-24/L-66 OC-M24L66 7/12/2011	M-24/L-66 OC-M24L66 10/13/2011
Simazine	0.00051 U							
NDMA (mg/L)								
N-Nitrosodimethylamine	0.000002 U	0.0000019 U	0.0000019 U	0.0000019 U	0.000002 U	0.0000019 U	0.000002 U	0.0000019 U
Metals, Total (mg/L)								
Calcium	7	4.1	89	66	4.7	7.1	83	
Chromium	0.005 U	0.005 U	0.0014 J	0.005 U				
Sodium	3.1	2.3	27	20	2.5	2.3	23	3.1
Inorganics (mg/L)								
Chloride	3.2	2.9	160	150	2.8	2.7	140	2.9
Nitrate as N	0.05 U	0.072	0.2 J	0.2	0.05 U	0.05 U	0.16	0.05 U
Nitrite as N	0.01 U	0.01 U	0.01 U	0.1 U	0.01 U	0.01 U	0.1 U	0.01 U
Nitrogen, as Ammonia	0.1 U	0.1 U	0.1 U	0.18	0.1 UJ	0.1 U	0.1 U	0.1 U
Sulfate	9	9	18	19	8.5	12	14	9.9
Specialty Compounds (mg/L)								
Hydrazine		0.0002 U	0.0002 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	
Monomethylhydrazine (MMH)		0.0005 U	0.0005 UJ	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
UDMH		0.0005 U	0.001 UJ	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
Acetaldehyde		0.03 U	0.03 U	0.03 U	0.75 U	0.03 U	0.03 U	
Formaldehyde		0.03 U	0.03 U	0.0064 J	0.75 U	0.03 U	0.03 U	
Phthalic Acid/Phthalic anhydride		0.01 U						

mg/L = milligram per liter

Prepared by / Date: KJC 03/27/12

Checked by / Date: BJR 03/29/12

U = not detected, value is the reporting limit

J = value is estimated

R = value is rejected

Table A-16
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-72A
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-72A OC-M24L72A 10/8/2008	M-24/L-72A OC-M24L72A 3/30/2010	M-24/L-72A OC-M24L72A 8/4/2010	M-24/L-72A OC-M24L72A 10/26/2010	M-24/L-72A OC-M24L72A 12/17/2010	M-24/L-72A OC-M24L72A 3/30/2011	M-24/L-72A OC-M24L72A 7/13/2011	M-24/L-72A OC-M24L72A 10/12/2011
Volatile Organics (mg/L)								
1,1,1,2-Tetrachloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1,1-Trichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
1,1,2,2-Tetrachloroethane	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
1,1,2-Trichloro-1,2,2-Trifluoroethane		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1,2-Trichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloropropene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,3-Trichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,3-Trichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,4-Trichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,4-Trimethylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dibromo-3-chloropropane	0.0005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	
1,2-Dibromoethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3,5-Trimethylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,4-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,4-Dioxane		R	0.05 U	0.05 UJ	0.05 UJ	0.05 U	0.05 UJ	
2,2-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
2,4,4-Trimethyl-1-pentene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
2,4,4-Trimethyl-2-pentene	0.001 UJ	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
2-Butanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Chlorotoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
2-Hexanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	
4-Chlorotoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
4-iso-Propyltoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
4-Methyl-2-pentanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Acetic acid, methyl ester		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Acetone		0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U	
Benzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromochloromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromodichloromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 U	0.0005 U	
Bromoform	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Bromomethane	0.0005 U	0.002 UJ	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	

Table A-16
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-72A
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-72A OC-M24L72A 10/8/2008	M-24/L-72A OC-M24L72A 3/30/2010	M-24/L-72A OC-M24L72A 8/4/2010	M-24/L-72A OC-M24L72A 10/26/2010	M-24/L-72A OC-M24L72A 12/17/2010	M-24/L-72A OC-M24L72A 3/30/2011	M-24/L-72A OC-M24L72A 7/13/2011	M-24/L-72A OC-M24L72A 10/12/2011
Butane, 2-methoxy-2-methyl-		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 UJ	
Carbon disulfide		0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.00064 J	
Carbon tetrachloride	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Chlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chlorodibromomethane	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
Chloroethane	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Chloroform	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chloromethane	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Cis-1,2-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
cis-1,3-Dichloropropene	0.0005 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	
Cyclohexane		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Dibromomethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Dichlorodifluoromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 UJ	0.001 U	
Diethyl ether		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Ethyl benzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Ethyl-t-Butyl Ether		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 UJ	
Hexachlorobutadiene	0.0005 U	0.0004 U	0.0004 U	0.0004 UJ	0.0004 U	0.0004 U	0.0004 U	
Isopropyl ether		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Isopropylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Methyl cyclohexane		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Methyl Tertbutyl Ether	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.00024 J	
Methylene chloride	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Naphthalene	0.0005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	
n-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Propylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
sec-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Styrene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
tert-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Tetrachloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Tetrahydrofuran		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Toluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
trans-1,2-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
trans-1,3-Dichloropropene	0.0005 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	
Trichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Trichlorofluoromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Vinyl chloride	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 UJ	0.0005 U	0.0005 U	
Xylene, o	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Xylenes (m&p)	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	

Table A-16
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-72A
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-72A OC-M24L72A 10/8/2008	M-24/L-72A OC-M24L72A 3/30/2010	M-24/L-72A OC-M24L72A 8/4/2010	M-24/L-72A OC-M24L72A 10/26/2010	M-24/L-72A OC-M24L72A 12/17/2010	M-24/L-72A OC-M24L72A 3/30/2011	M-24/L-72A OC-M24L72A 7/13/2011	M-24/L-72A OC-M24L72A 10/12/2011
Semivolatile Organics (mg/L)								
1,2,4,5-Tetrachlorobenzene		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	
1-Methylnaphthalene		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,3,4,6-Tetrachlorophenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,4,5-Trichlorophenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,4,6-Trichlorophenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,4-Dichlorophenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,4-Dimethylphenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,4-Dinitrophenol		0.0045 UJ	0.0045 UJ	0.0045 U	R	0.0045 U	0.0045 U	
2,4-Dinitrotoluene		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,6-Dinitrotoluene		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2-Choronaphthalene		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2-Chlorophenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2-Methylnaphthalene		0.00091 U	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	
2-Methylphenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2-Nitroaniline		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2-Nitrophenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
3 & 4 Methylphenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
3,3'-Dichlorobenzidine		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
3-Nitroaniline		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
4,6-Dinitro-2-methylphenol		0.0045 U	0.0045 UJ	0.0045 U	R	R	0.0045 U	
4-Bromophenyl phenyl ether		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
4-Chloro-3-methylphenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
4-Chloroaniline		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
4-Chlorophenyl phenyl ether		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
4-Nitroaniline		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
4-Nitrophenol		0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 UJ	
Acenaphthene		0.00091 U	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	
Acenaphthylene		0.00027 U	0.00027 UJ	0.00027 U	0.00027 U	0.00027 U	0.00027 U	
Acetophenone		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
Alachlor	0.0002 U							
Aniline		0.0045 U	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	
Anthracene		0.00091 U	0.00091 UJ	0.00008 J	0.00091 U	0.00091 U	0.00091 U	
Atrazine	0.0002 U	0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
Azobenzene		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
Benzaldehyde		0.0045 U	0.0045 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	
Benzo(a)anthracene		0.00027 U	0.00027 UJ	0.00032	0.00027 U	0.00027 U	0.00027 U	
Benzo(a)pyrene	0.0002 U	0.00018 U	0.00018 UJ	0.00021	0.00018 U	0.00018 U	0.00018 U	
Benzo(b)fluoranthene		0.00027 U	0.00027 UJ	0.0002 J	0.00027 U	0.00027 U	0.00027 U	
Benzo(ghi)perylene		0.00045 U	0.00045 UJ	0.0001 J	0.00045 U	0.00045 U	0.00045 U	

Table A-16
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-72A
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-72A OC-M24L72A 10/8/2008	M-24/L-72A OC-M24L72A 3/30/2010	M-24/L-72A OC-M24L72A 8/4/2010	M-24/L-72A OC-M24L72A 10/26/2010	M-24/L-72A OC-M24L72A 12/17/2010	M-24/L-72A OC-M24L72A 3/30/2011	M-24/L-72A OC-M24L72A 7/13/2011	M-24/L-72A OC-M24L72A 10/12/2011
Benzo(k)fluoranthene		0.00027 U	0.00027 UJ	0.00027 U	0.00027 U	0.00027 U	0.00027 U	0.00027 U
Benzoic Acid		0.0013 J	R	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 U	0.0045 U
Benzyl alcohol		0.0091 U	0.0091 UJ	0.0091 U	0.0091 U	0.0091 U	0.0091 U	0.0091 U
Biphenyl		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Bis(2-Chloroethoxy)methane		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Bis(2-Chloroethyl)ether		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Bis(2-Chloroisopropyl)ether		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Bis(2-Ethylhexyl)phthalate	0.0018 J	0.0018 U	0.0018 UJ	0.02 U	0.0018 UJ	0.0018 U	0.0018 U	
Butylbenzylphthalate		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Caprolactam		0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	
Carbazole		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
Chrysene		0.00091 U	0.00017 J	0.00026 J	0.00091 U	0.00091 U	0.00091 U	
Di-2-ethylhexyladipate	0.0015 U							
Dibenz(a,h)anthracene		0.00045 U	0.00045 UJ	0.00045 U	0.00045 U	0.00045 U	0.00045 U	
Dibenzo furan		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
Diethylphthalate		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
Dimethylphthalate		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
Di-n-butylphthalate		0.0016 J	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
Di-n-octylphthalate		0.0045 U	0.0045 UJ	0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	
Diphenyl ether		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
Diphenylmethanone		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
Endrin	0.00051 U							
Fluoranthene		0.00091 U	0.00091 UJ	0.00047 J	0.00091 U	0.00091 U	0.00091 U	
Fluorene		0.00091 U	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	
Gamma-BHC/Lindane	0.0002 U							
Heptachlor	0.0002 U							
Heptachlor epoxide	0.0002 UJ							
Hexachlorobenzene	0.0002 U	0.00091 U	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	
Hexachlorocyclopentadiene	0.002 U	0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 UJ	
Hexachloroethane		0.0027 U	0.0027 UJ	0.0027 U	0.0027 U	0.0027 U	0.0027 UJ	
Indeno(1,2,3-cd)pyrene		0.00045 U	0.00045 UJ	0.0001 J	0.00045 U	0.00045 U	0.00045 U	
Isophorone		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
Methoxychlor	0.00051 U							
Nitrobenzene		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
N-Nitrosodi-n-propylamine		0.0000096 U	0.0000097 U	0.0000019 U	0.000002 U	0.0000019 U	0.0000019 U	0.0000019 U
N-Nitrosodiphenylamine		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
Pentachlorophenol		0.00091 U	0.00091 UJ	0.00091 U	R	0.00091 U	0.00091 U	
Phenanthrene		0.00018 U	0.00018 UJ	0.00021	0.00018 U	0.00018 U	0.00018 U	
Phenol		0.0045 UJ	0.0045 UJ	0.0045 U	0.0045 UJ	0.0045 UJ	0.0045 U	
Pyrene		0.0045 U	0.0045 UJ	0.00038 J	0.0045 U	0.0045 U	0.0045 U	

Table A-16
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-72A
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-72A OC-M24L72A 10/8/2008	M-24/L-72A OC-M24L72A 3/30/2010	M-24/L-72A OC-M24L72A 8/4/2010	M-24/L-72A OC-M24L72A 10/26/2010	M-24/L-72A OC-M24L72A 12/17/2010	M-24/L-72A OC-M24L72A 3/30/2011	M-24/L-72A OC-M24L72A 7/13/2011	M-24/L-72A OC-M24L72A 10/12/2011
Simazine	0.00051 U							
NDMA (mg/L)								
N-Nitrosodimethylamine	0.000002 U	0.0000019 U	0.0000019 U	0.0000019 UJ	0.000002 U	0.0000032	0.0000019 U	0.0000019 U
Metals, Total(mg/L)								
Calcium	62	82	77	64	61	74	88	
Chromium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Sodium	15	18	19	14	13	17	19	17
Inorganics (mg/L)								
Chloride	65	100	120	93	82	100	120	110
Nitrate as N	0.05 U	0.56	0.33	1.1	0.96	0.35	0.42 J	0.39
Nitrite as N	0.01 U	0.01 U	0.1 U	0.1 U	0.01 U	0.1 U	0.01 U	0.1 UJ
Nitrogen, as Ammonia	0.1 U	0.1 U	0.1 U	0.14	0.1 UJ	0.1 U	0.1 U	0.1 U
Sulfate	22	19	19	21	23	17	16	19
Specialty Compounds (mg/L)								
Hydrazine		0.0002 U	0.0002 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	
Monomethylhydrazine (MMH)		0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
UDMH		0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
Acetaldehyde		0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	
Formaldehyde		0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	
Phthalic Acid/Phthalic anhydride		0.01 U						

mg/L = milligram per liter

Prepared by / Date: KJC 03/27/12

Checked by / Date: BJR 03/29/12

U = not detected, value is the reporting limit

J = value is estimated

R = value is rejected

Table A-17
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-87A
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-87A OC-M24L87 10/7/2008	M-24/L-87A OC-M24L87 3/30/2010	M-24/L-87A OC-M24L87 8/4/2010	M-24/L-87A OC-M24L87 11/5/2010	M-24/L-87A OC-M24L87 12/16/2010	M-24/L-87A OC-M24L87 3/30/2011	M-24/L-87A OC-M24L87 7/12/2011	M-24/L-87A OC-M24L87 10/12/2011
Volatile Organics (mg/L)								
1,1,1,2-Tetrachloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1,1-Trichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
1,1,2,2-Tetrachloroethane	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
1,1,2-Trichloro-1,2,2-Trifluoroethane		0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1,2-Trichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloropropene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,3-Trichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,3-Trichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,4-Trichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,4-Trimethylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dibromo-3-chloropropane	0.0005 U	0.005 U	0.005 U	0.005 UJ	0.005 U	0.005 U	0.005 U	
1,2-Dibromoethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3,5-Trimethylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,4-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,4-Dioxane		R	0.05 U	0.05 UJ	0.05 UJ	0.05 U	0.05 UJ	
2,2-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	0.001 U	
2,4,4-Trimethyl-1-pentene	0.001 U *	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
2,4,4-Trimethyl-2-pentene	0.001 UJ	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
2-Butanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Chlorotoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
2-Hexanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U
4-Chlorotoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
4-iso-Propyltoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
4-Methyl-2-pentanone		0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Acetic acid, methyl ester		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Acetone		0.05 UJ	0.05 UJ	0.05 U	0.05 UJ	0.05 UJ	0.05 U	
Benzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromochloromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromodichloromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 U	0.0005 U	
Bromoform	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Bromomethane	0.0005 U	0.002 UJ	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	

Table A-17
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-87A
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Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-87A OC-M24L87 10/7/2008	M-24/L-87A OC-M24L87 3/30/2010	M-24/L-87A OC-M24L87 8/4/2010	M-24/L-87A OC-M24L87 11/5/2010	M-24/L-87A OC-M24L87 12/16/2010	M-24/L-87A OC-M24L87 3/30/2011	M-24/L-87A OC-M24L87 7/12/2011	M-24/L-87A OC-M24L87 10/12/2011
Butane, 2-methoxy-2-methyl-		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 UJ	
Carbon disulfide		0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	
Carbon tetrachloride	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Chlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chlorodibromomethane	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
Chloroethane	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Chloroform	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chloromethane	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Cis-1,2-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
cis-1,3-Dichloropropene	0.0005 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	
Cyclohexane		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Dibromomethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Dichlorodifluoromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 UJ	0.001 U	
Diethyl ether		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Ethyl benzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Ethyl-t-Butyl Ether		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 UJ	
Hexachlorobutadiene	0.0005 U	0.0004 U	0.0004 U	0.0004 UJ	0.0004 U	0.0004 U	0.0004 U	
Isopropyl ether		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Isopropylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Methyl cyclohexane		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Methyl Tertbutyl Ether	0.0086	0.001 U	0.001 U	0.0044	0.0059	0.001 U	0.001 U	
Methylene chloride	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Naphthalene	0.0005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	
n-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Propylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
sec-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Styrene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
tert-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Tetrachloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Tetrahydrofuran		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
Toluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
trans-1,2-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
trans-1,3-Dichloropropene	0.0005 U	0.0004 U	0.0004 U	0.0004 UJ	0.0004 U	0.0004 U	0.0004 U	
Trichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Trichlorofluoromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	
Vinyl chloride	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 UJ	0.0005 U	0.0005 U	
Xylene, o	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Xylenes (m&p)	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	

Table A-17
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-87A
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-87A OC-M24L87 10/7/2008	M-24/L-87A OC-M24L87 3/30/2010	M-24/L-87A OC-M24L87 8/4/2010	M-24/L-87A OC-M24L87 11/5/2010	M-24/L-87A OC-M24L87 12/16/2010	M-24/L-87A OC-M24L87 3/30/2011	M-24/L-87A OC-M24L87 7/12/2011	M-24/L-87A OC-M24L87 10/12/2011
Semivolatile Organics (mg/L)								
1,2,4,5-Tetrachlorobenzene		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
1-Methylnaphthalene		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,3,4,6-Tetrachlorophenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,4,5-Trichlorophenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,4,6-Trichlorophenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,4-Dichlorophenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,4-Dimethylphenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,4-Dinitrophenol		0.0045 UJ	0.0045 UJ	0.0045 UJ	R	0.0045 U	0.0045 U	
2,4-Dinitrotoluene		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2,6-Dinitrotoluene		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2-Choronaphthalene		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2-Chlorophenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2-Methylnaphthalene		0.00091 U	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	
2-Methylphenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2-Nitroaniline		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
2-Nitrophenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
3 & 4 Methylphenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
3,3'-Dichlorobenzidine		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
3-Nitroaniline		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	
4,6-Dinitro-2-methylphenol		0.0045 U	0.0045 UJ	0.0045 UJ	R	R	0.0045 U	
4-Bromophenyl phenyl ether		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
4-Chloro-3-methylphenol		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
4-Chloroaniline		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
4-Chlorophenyl phenyl ether		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
4-Nitroaniline		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
4-Nitrophenol		0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	
Acenaphthene		0.00091 U	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	
Acenaphthylene		0.00027 U	0.00027 UJ	0.00027 U	0.00027 U	0.00027 U	0.00027 U	
Acetophenone		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
Alachlor	0.0002 U							
Aniline		0.0045 U	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 U	
Anthracene		0.00091 U	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	
Atrazine	0.0002 U	0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
Azobenzene		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	
Benzaldehyde		0.0045 U	0.0045 UJ	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	
Benzo(a)anthracene		0.00027 U	0.00027 UJ	0.00027 U	0.00027 U	0.00027 U	0.00027 U	
Benzo(a)pyrene	0.0002 U	0.00018 U	0.00018 UJ	0.00018 U	0.00018 U	0.00018 U	0.00018 U	
Benzo(b)fluoranthene		0.00027 U	0.00027 UJ	0.00027 U	0.00027 U	0.00027 U	0.00027 U	
Benzo(ghi)perylene		0.00045 U	0.00045 UJ	0.00045 U	0.00045 U	0.00045 U	0.00045 U	

Table A-17
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-87A
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-87A OC-M24L87 10/7/2008	M-24/L-87A OC-M24L87 3/30/2010	M-24/L-87A OC-M24L87 8/4/2010	M-24/L-87A OC-M24L87 11/5/2010	M-24/L-87A OC-M24L87 12/16/2010	M-24/L-87A OC-M24L87 3/30/2011	M-24/L-87A OC-M24L87 7/12/2011	M-24/L-87A OC-M24L87 10/12/2011
Benzo(k)fluoranthene		0.00027 U	0.00027 UJ	0.00027 U	0.00027 U	0.00027 U	0.00027 U	0.00027 U
Benzoic Acid		0.0011 J	R	0.0016 J	0.0045 UJ	0.0045 UJ	0.0045 U	0.0045 U
Benzyl alcohol		0.0091 U	0.0091 UJ	0.0091 U	0.0091 U	0.0091 U	0.0091 U	0.0091 U
Biphenyl		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Bis(2-Chloroethoxy)methane		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Bis(2-Chloroethyl)ether		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Bis(2-Chloroisopropyl)ether		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Bis(2-Ethylhexyl)phthalate	0.002 U	0.0018 U	0.0018 UJ	0.0018 U	0.0018 UJ	0.0018 U	0.0018 U	0.0018 U
Butylbenzylphthalate		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Caprolactam		0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ
Carbazole		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 UJ	0.0045 U	0.0045 U
Chrysene		0.00091 U	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00091 U
Di-2-ethylhexyladipate	0.0015 U							
Dibenz(a,h)anthracene		0.00045 U	0.00045 UJ	0.00045 U	0.00045 U	0.00045 U	0.00045 U	0.00045 U
Dibenzo furan		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Diethylphthalate		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Dimethylphthalate		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Di-n-butylphthalate		0.0018 J	0.0045 UJ	0.00088 J	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Di-n-octylphthalate		0.0045 U	0.0045 UJ	0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U
Diphenyl ether		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Diphenylmethanone		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Endrin	0.00051 U							
Fluoranthene		0.00091 U	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00091 U
Fluorene		0.00091 U	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00091 U
Gamma-BHC/Lindane	0.0002 U							
Heptachlor	0.0002 U							
Heptachlor epoxide	0.0002 UJ							
Hexachlorobenzene	0.0002 U	0.00091 U	0.00091 UJ	0.00091 U	0.00091 U	0.00091 U	0.00091 U	0.00091 U
Hexachlorocyclopentadiene	0.002 U	0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Hexachloroethane		0.0027 U	0.0027 UJ	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0027 UJ
Indeno(1,2,3-cd)pyrene		0.00045 U	0.00045 UJ	0.00045 U	0.00045 U	0.00045 U	0.00045 U	0.00045 U
Isophorone		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Methoxychlor	0.00051 U							
Nitrobenzene		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
N-Nitrosodi-n-propylamine		0.0000094 U	0.0000096 U	0.0000019 U	0.0000019 U	0.0000019 U	0.0000019 U	0.0000019 U
N-Nitrosodiphenylamine		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U
Pentachlorophenol		0.00091 U	0.00091 UJ	0.00091 U	R	0.00091 U	0.00091 U	
Phenanthrene		0.00018 U	0.00018 UJ	0.00018 U	0.00018 U	0.00018 U	0.00018 U	0.00018 U
Phenol		0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 UJ	0.0045 U	0.0045 U
Pyrene		0.0045 U	0.0045 UJ	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U

Table A-17
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-87A
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-87A OC-M24L87 10/7/2008	M-24/L-87A OC-M24L87 3/30/2010	M-24/L-87A OC-M24L87 8/4/2010	M-24/L-87A OC-M24L87 11/5/2010	M-24/L-87A OC-M24L87 12/16/2010	M-24/L-87A OC-M24L87 3/30/2011	M-24/L-87A OC-M24L87 7/12/2011	M-24/L-87A OC-M24L87 10/12/2011
Simazine	0.00051 U							
NDMA (mg/L)								
N-Nitrosodimethylamine	0.000002 U	0.0000019 U	0.0000019 U	0.0000019 U	0.0000019 U	0.0000019 U	0.0000019 U	0.0000019 U
Metals, Total (mg/L)								
Calcium	110	67	64	96	85	77	82	
Chromium	0.005 U	0.005 U	0.0014 J	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Sodium	31	19	76	25	24	22	58	23
Chromium, Hexavalent								0.001 UJ
Inorganics (mg/L)								
Chloride	160	99	170	180	160	120	160	170
Nitrate as N	0.22	0.14	2.3	0.14	0.18	0.11	1.8	0.097
Nitrite as N	0.01 U	0.01 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ
Nitrogen, as Ammonia	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U
Sulfate	18	19	15	21	20	18	14	18
Specialty Compounds (mg/L)								
Hydrazine		0.0002 U	0.0002 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	
Monomethylhydrazine (MMH)		0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
UDMH		0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
Acetaldehyde		0.03 U	0.03 U	0.03 U	0.75 U	0.03 U	0.03 U	
Formaldehyde		0.03 U	0.03 U	0.03 U	0.75 U	0.03 U	0.03 U	
Phthalic Acid/Phthalic anhydride		0.01 U						

mg/L = milligram per liter

Prepared by / Date: KJC 03/27/12

Checked by / Date: BJR 03/29/12

U = not detected, value is the reporting limit

J = value is estimated

R = value is rejected

Table A-18
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-94
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-94 OC-M24L94 12/5/2008	M-24/L-94 OC-M24L94 3/18/2009	M-24/L-94 OC-M24L94 11/10/2009	M-24/L-94 OC-M24L94 7/8/2010	M-24/L-94 OC-M24L94 8/4/2010	M-24/L-94 OC-M24L94 9/29/2010	M-24/L-94 OC-M24L94 10/26/2010	M-24/L-94 OC-M24L94 12/17/2010	M-24/L-94 OC-M24L94 3/30/2011	M-24/L-94 OC-M24L94 7/12/2011	M-24/L-94 OC-M24L94 10/12/2011
Volatile Organics (mg/L)											
1,1,1,2-Tetrachloroethane	0.0005 U		0.001 U								
1,1,1-Trichloroethane	0.0005 U		0.001 U								
1,1,2,2-Tetrachloroethane	0.0005 U		0.0005 U								
1,1,2-Trichloro-1,2,2-Trifluoroethane			0.001 U								
1,1,2-Trichloroethane	0.0005 U		0.001 U								
1,1-Dichloroethane	0.0005 U		0.001 U								
1,1-Dichloroethene	0.0005 UJ		0.001 U								
1,1-Dichloropropene	0.0005 U		0.001 U								
1,2,3-Trichlorobenzene	0.0005 U		0.001 U								
1,2,3-Trichloropropane	0.0005 U		0.001 U								
1,2,4-Trichlorobenzene	0.0005 U		0.001 U								
1,2,4-Trimethylbenzene	0.0005 U		0.001 U								
1,2-Dibromo-3-chloropropane	0.0005 UJ		0.005 U								
1,2-Dibromoethane	0.0005 U		0.001 U								
1,2-Dichlorobenzene	0.0005 U		0.001 U								
1,2-Dichloroethane	0.0005 U		0.001 U								
1,2-Dichloropropane	0.0005 U		0.001 U								
1,3,5-Trimethylbenzene	0.0005 U		0.001 U								
1,3-Dichlorobenzene	0.0005 U		0.001 U								
1,3-Dichloropropane	0.0005 U		0.001 U								
1,4-Dichlorobenzene	0.0005 U		0.001 U								
1,4-Dioxane			0.05 U								
2,2-Dichloropropane	0.0005 U		0.001 UJ								
2,4,4-Trimethyl-1-pentene	0.001 U		0.001 U								
2,4,4-Trimethyl-2-pentene	0.001 U		0.001 U								
2-Butanone			0.01 U								
2-Chlorotoluene	0.0005 U		0.001 U								
2-Hexanone			0.01 U								
4-Chlorotoluene	0.0005 U		0.001 U								
4-iso-Propyltoluene	0.0005 U		0.001 U								
4-Methyl-2-pentanone			0.01 U								
Acetic acid, methyl ester			0.01 U								
Acetone			0.05 U								
Benzene	0.0005 U		0.001 U								
Bromobenzene	0.0005 U		0.001 U								
Bromochloromethane	0.0005 U		0.001 U								
Bromodichloromethane	0.0005 U		0.001 U								
Bromoform	0.0005 U		0.001 U								
Bromomethane	0.0005 U		0.002 UJ								
Butane, 2-methoxy-2-methyl-			0.005 UJ								
Carbon disulfide			0.01 U								
Carbon tetrachloride	0.0005 U		0.001 U								
Chlorobenzene	0.0005 U		0.001 U								
Chlorodibromomethane	0.0005 U		0.0005 U								
Chloroethane	0.0005 U		0.002 U								
Chloroform	0.0005 U		0.001 U								
Chloromethane	0.0005 UJ		0.002 U								
Cis-1,2-Dichloroethene	0.0005 U		0.001 U								
cis-1,3-Dichloropropene	0.0005 U		0.0004 U								

Table A-18
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-94
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-94 OC-M24L94 12/5/2008	M-24/L-94 OC-M24L94 3/18/2009	M-24/L-94 OC-M24L94 11/10/2009	M-24/L-94 OC-M24L94 7/8/2010	M-24/L-94 OC-M24L94 8/4/2010	M-24/L-94 OC-M24L94 9/29/2010	M-24/L-94 OC-M24L94 10/26/2010	M-24/L-94 OC-M24L94 12/17/2010	M-24/L-94 OC-M24L94 3/30/2011	M-24/L-94 OC-M24L94 7/12/2011	M-24/L-94 OC-M24L94 10/12/2011
Cyclohexane			0.01 U								
Dibromomethane	0.0005 U		0.001 U								
Dichlorodifluoromethane	0.0005 U		0.001 U								
Diethyl ether			0.01 U								
Ethyl benzene	0.0005 U		0.001 U								
Ethyl-t-Butyl Ether			0.005 UJ								
Hexachlorobutadiene	0.0005 U		0.0004 U								
Isopropyl ether			0.01 U								
Isopropylbenzene	0.0005 U		0.001 U								
Methyl cyclohexane			0.01 U								
Methyl Tertbutyl Ether	0.0005 U		0.001 U								
Methylene chloride	0.0005 U		0.002 U								
Naphthalene	0.0005 U		0.005 U								
n-Butylbenzene	0.0005 U		0.001 U								
Propylbenzene	0.0005 U		0.001 U								
sec-Butylbenzene	0.0005 U		0.001 U								
Styrene	0.0005 U		0.001 U								
tert-Butylbenzene	0.0005 U		0.001 U								
Tetrachloroethene	0.0005 U		0.001 U								
Tetrahydrofuran			0.01 U								
Toluene	0.0005 U		0.001 U								
trans-1,2-Dichloroethene	0.0005 UJ		0.001 U								
trans-1,3-Dichloropropene	0.0005 U		0.0004 U								
Trichloroethene	0.0005 U		0.001 U								
Trichlorofluoromethane	0.0005 U		0.001 U								
Vinyl chloride	0.0005 U		0.0005 U								
Xylene, o	0.0005 U		0.001 U								
Xylenes (m&p)	0.001 U		0.002 U								
Semivolatile Organics (mg/L)											
1,2,4,5-Tetrachlorobenzene		0.0051 U	0.0045 U								0.0049 UJ
1,2,4-Trichlorobenzene		0.0051 U									
1,2-Dichlorobenzene		0.0051 U									
1,3-Dichlorobenzene		0.0051 U									
1,4-Dichlorobenzene		0.0051 U									
1-Methylnaphthalene			0.0045 U								0.0049 UJ
2,3,4,6-Tetrachlorophenol			0.0045 U								0.0049 UJ
2,4,5-Trichlorophenol	0.0051 U		0.0045 U								0.0049 UJ
2,4,6-Trichlorophenol	0.0051 U		0.0045 U								0.0049 UJ
2,4-Dichlorophenol	0.0051 U		0.0045 U								0.0049 UJ
2,4-Dimethylphenol	0.0051 U		0.0045 U								0.0049 UJ
2,4-Dinitrophenol	0.0051 U		0.0045 UJ								0.0049 UJ
2,4-Dinitrotoluene	0.0051 U		0.0045 U								0.0049 UJ
2,6-Dinitrotoluene	0.0051 U		0.0045 U								0.0049 UJ
2-Chloronaphthalene	0.0051 U		0.0045 U								0.0049 UJ
2-Chlorophenol	0.0051 U		0.0045 U								0.0049 UJ
2-Methylnaphthalene		0.001 U	0.00091 U								0.00098 UJ
2-Methylphenol	0.0051 U		0.0045 U								0.0049 UJ
2-Nitroaniline	0.0051 U		0.0045 U								0.0049 UJ
2-Nitrophenol	0.0051 U		0.0045 U								0.0049 UJ
3 & 4 Methylphenol		0.0051 U	0.0045 U								0.0049 UJ

Table A-18
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-94
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-94 OC-M24L94 12/5/2008	M-24/L-94 OC-M24L94 3/18/2009	M-24/L-94 OC-M24L94 11/10/2009	M-24/L-94 OC-M24L94 7/8/2010	M-24/L-94 OC-M24L94 8/4/2010	M-24/L-94 OC-M24L94 9/29/2010	M-24/L-94 OC-M24L94 10/26/2010	M-24/L-94 OC-M24L94 12/17/2010	M-24/L-94 OC-M24L94 3/30/2011	M-24/L-94 OC-M24L94 7/12/2011	M-24/L-94 OC-M24L94 10/12/2011
3,3'-Dichlorobenzidine		0.0051 U	0.0045 U								0.0049 UJ
3-Nitroaniline		0.0051 U	0.0045 U								0.0049 UJ
4,6-Dinitro-2-methylphenol		0.0051 U	0.0045 U								0.0049 UJ
4-Bromophenyl phenyl ether		0.0051 U	0.0045 U								0.0049 UJ
4-Chloro-3-methylphenol		0.0051 U	0.0045 U								0.0049 UJ
4-Chloroaniline		0.0051 U	0.0045 U								0.0049 UJ
4-Chlorophenyl phenyl ether		0.0051 U	0.0045 U								0.0049 UJ
4-Nitroaniline			0.0045 U								0.0049 UJ
4-Nitrophenol		0.0051 UJ	0.0045 UJ								0.0049 UJ
Acenaphthene		0.001 U	0.00091 U								0.00098 UJ
Acenaphthylene		0.0003 U	0.00027 U								0.00029 UJ
Acetophenone		0.0051 U	0.0045 U								0.0049 UJ
Alachlor	0.0002 U										
Aniline		0.0051 UJ	0.0045 UJ								0.0049 UJ
Anthracene		0.001 U	0.00091 U								0.00098 UJ
Atrazine	0.0002 U		0.0045 U								0.0049 UJ
Azobenzene		0.0051 U	0.0045 U								0.0049 UJ
Benzaldehyde			0.0045 U								0.0049 UJ
Benzo(a)anthracene		0.0003 U	0.00027 U								0.00029 UJ
Benzo(a)pyrene	0.0002 U	0.0002 U	0.00018 U								0.0002 UJ
Benzo(b)fluoranthene		0.0003 U	0.00027 U								0.00029 UJ
Benzo(ghi)perylene		0.00051 U	0.00045 U								0.00049 UJ
Benzo(k)fluoranthene		0.0003 U	0.00027 U								0.00029 UJ
Benzoic Acid			R								0.0049 UJ
Benzyl alcohol			0.0091 U								0.0098 UJ
Biphenyl			0.0045 U								0.0049 UJ
Bis(2-Chloroethoxy)methane		0.0051 U	0.0045 U								0.0049 UJ
Bis(2-Chloroethyl)ether		0.0051 U	0.0045 U								0.0049 UJ
Bis(2-Chloroisopropyl)ether		0.0051 U	0.0045 U								0.0049 UJ
Bis(2-Ethylhexyl)phthalate	0.002 U	0.0029 U	0.0018 U								0.002 UJ
Butylbenzylphthalate		0.0051 U	0.0045 U								0.0049 UJ
Caprolactam			0.0045 U								0.0049 UJ
Carbazole			0.0045 U								0.0049 UJ
Chrysene		0.001 U	0.00091 U								0.00098 UJ
Di-2-ethylhexyladipate	0.0015 U										
Dibenz(a,h)anthracene		0.00051 U	0.00045 U								0.00049 UJ
Dibenzofuran		0.0051 U	0.0045 U								0.0049 UJ
Diethylphthalate		0.0051 U	0.0045 U								0.0049 UJ
Dimethylphthalate		0.0051 U	0.0045 U								0.0049 UJ
Di-n-butylphthalate		0.0051 U	0.0045 U								0.0049 UJ
Di-n-octylphthalate		0.0051 U	0.0045 U								0.0049 UJ
Diphenyl ether			0.0045 U								0.0049 UJ
Diphenylmethanone			0.0045 U								0.0049 UJ
Endrin	0.00051 U										
Fluoranthene		0.001 U	0.00091 U								0.00098 UJ
Fluorene		0.001 U	0.00091 U								0.00098 UJ
Gamma-BHC/Lindane	0.0002 U										
Heptachlor	0.0002 U										
Heptachlor epoxide	0.0002 U										
Hexachlorobenzene	0.0002 U	0.001 U	0.00091 U								0.00098 UJ

Table A-18
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-24/L-94
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-24/L-94 OC-M24L94 12/5/2008	M-24/L-94 OC-M24L94 3/18/2009	M-24/L-94 OC-M24L94 11/10/2009	M-24/L-94 OC-M24L94 7/8/2010	M-24/L-94 OC-M24L94 8/4/2010	M-24/L-94 OC-M24L94 9/29/2010	M-24/L-94 OC-M24L94 10/26/2010	M-24/L-94 OC-M24L94 12/17/2010	M-24/L-94 OC-M24L94 3/30/2011	M-24/L-94 OC-M24L94 7/12/2011	M-24/L-94 OC-M24L94 10/12/2011
Hexachlorobutadiene		0.0004 U									
Hexachlorocyclopentadiene	0.002 U		0.0045 UJ								0.0049 UJ
Hexachloroethane		0.003 U	0.0027 U								0.0029 UJ
Indeno(1,2,3-cd)pyrene		0.00051 U	0.00045 U								0.00049 UJ
Isophorone		0.0051 U	0.0045 U								0.0049 UJ
Methoxychlor	0.00051 U										
Naphthalene		0.001 U									
Nitrobenzene		0.0051 U	0.0045 U								0.0049 UJ
N-Nitrosodi-n-propylamine		0.00001 U	0.00001 U	0.0000096 UJ	0.0000094 U	0.0000089 U	0.0000019 U	0.0000019 U	0.0000019 U	0.0000019 U	0.0000019 U
N-Nitrosodiphenylamine			0.0045 U								0.0049 UJ
Pentachlorophenol		0.001 U	0.00091 U								0.00098 UJ
Phenanthrene		0.0002 U	0.00018 U								0.0002 UJ
Phenol		0.0051 UJ	0.0045 UJ								0.0049 UJ
Pyrene		0.0051 U	0.0045 U								0.0049 UJ
Simazine	0.00051 U										
NDMA (mg/L)											
N-Nitrosodimethylamine	0.000014	0.000002 U	0.0000063	0.0000019 UJ	0.000031	0.000017	0.0000041 J	0.000013	0.000019 U	0.0000019 U	0.000004
Metals, Total (mg/L)											
Calcium	29		30	35 J	36	43	44	19	20	37	
Chromium	0.005 U		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.00067 J	0.005 U
Sodium	40		26	18	18	23	20	23	23	49	64
Chromium, Hexavalent											0.00073 J
Inorganics (mg/L)											
Chloride	78		36	2.5	29	35	35	43	47	120	200
Nitrate as N	1.5		1	0.7	0.67	0.4	0.33	1.8	1.7	1.5	1.3
Nitrite as N	0.01 U		0.01 U	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.1 U	0.1 U	0.1 UJ
Nitrogen, as Ammonia	0.1 U		0.1 U	0.1 U	0.1 U	0.11	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U
Sulfate	17		21	24	24	29	29	17	13	14	15
Specialty Compounds (mg/L)											
Hydrazine		0.00005 U	0.0002 U								
Monomethylhydrazine (MMH)		0.00025 U	0.0005 U								
UDMH		0.00025 U	0.0005 U								
Acetaldehyde		0.1 U	0.03 U								
Formaldehyde		0.05 U	0.03 U								

mg/L = milligram per liter

Prepared by / Date: KJC 03/27/12

Checked by / Date: BJR 03/29/12

U = not detected, value is the reporting limit

J = value is estimated

R = value is rejected

Table A-19
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-27/L-14C
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-27/L-14C OC-M27L14C 10/7/2008	M-27/L-14C OC-M27L14C 7/1/2010	M-27/L-14C OC-M27L14C 8/6/2010	M-27/L-14C OC-M27L14C 10/25/2010	M-27/L-14C OC-M27L14C 7/19/2011	M-27/L-14C OC-M27L14C 10/13/2011
Volatile Organics (mg/L)						
1,1,1,2-Tetrachloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1,1-Trichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1,2,2-Tetrachloroethane	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
1,1,2-Trichloro-1,2,2-Trifluoroethane		0.001 U	0.001 U	0.001 U	0.001 U	
1,1,2-Trichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,1-Dichloropropene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,3-Trichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,3-Trichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,4-Trichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2,4-Trimethylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dibromo-3-chloropropane	0.0005 U	0.005 U	0.005 U	0.005 U	0.005 U	
1,2-Dibromoethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichloroethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,2-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3,5-Trimethylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,3-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,4-Dichlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
1,4-Dioxane		0.05 U	0.05 U	0.05 UJ	0.05 UJ	
2,2-Dichloropropane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
2,4,4-Trimethyl-1-pentene	0.001 U *	0.001 U	0.001 U	0.001 U	0.001 U	
2,4,4-Trimethyl-2-pentene	0.001 UJ	0.001 U	0.001 U	0.001 U	0.001 U	
2-Butanone		0.01 U	0.01 U	0.01 U	0.01 U	
2-Chlorotoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
2-Hexanone		0.01 U	0.01 U	0.01 U	0.01 U	
4-Chlorotoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
4-iso-Propyltoluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
4-Methyl-2-pentanone		0.01 U	0.01 U	0.01 U	0.01 U	
Acetic acid, methyl ester		0.02 U	0.02 U	0.02 U	0.02 U	
Acetone		0.05 U	0.05 UJ	0.05 UJ	0.05 U	
Benzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromochloromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromodichloromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.0005 U	
Bromoform	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
Bromomethane	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	

Table A-19
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-27/L-14C
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-27/L-14C OC-M27L14C 10/7/2008	M-27/L-14C OC-M27L14C 7/1/2010	M-27/L-14C OC-M27L14C 8/6/2010	M-27/L-14C OC-M27L14C 10/25/2010	M-27/L-14C OC-M27L14C 7/19/2011	M-27/L-14C OC-M27L14C 10/13/2011
Butane, 2-methoxy-2-methyl-		0.005 U	0.005 U	0.005 U	0.005 UJ	
Carbon disulfide		0.01 U	0.01 U	0.01 U	0.00035 J	
Carbon tetrachloride	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chlorobenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chlorodibromomethane	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
Chloroethane	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	
Chloroform	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
Chloromethane	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	
Cis-1,2-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
cis-1,3-Dichloropropene	0.0005 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	
Cyclohexane		0.01 U	0.01 U	0.01 U	0.01 U	
Dibromomethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
Dichlorodifluoromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
Diethyl ether		0.01 U	0.01 U	0.01 U	0.01 U	
Ethyl benzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
Ethyl-t-Butyl Ether		0.005 U	0.005 U	0.005 U	0.005 UJ	
Hexachlorobutadiene	0.0005 U	0.0004 U	0.0004 U	0.0004 UJ	0.0004 U	
Isopropyl ether		0.01 U	0.01 U	0.01 U	0.01 U	
Isopropylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
Methyl cyclohexane		0.01 U	0.01 U	0.01 U	0.01 U	
Methyl Tertbutyl Ether	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
Methylene chloride	0.0005 U	0.002 U	0.002 U	0.002 U	0.002 U	
Naphthalene	0.0005 U	0.005 U	0.005 U	0.005 U	0.005 U	
n-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
Propylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
sec-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
Styrene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
tert-Butylbenzene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
Tetrachloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
Tetrahydrofuran		0.01 U	0.01 U	0.01 U	0.01 U	
Toluene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
trans-1,2-Dichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
trans-1,3-Dichloropropene	0.0005 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	
Trichloroethene	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
Trichlorofluoromethane	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
Vinyl chloride	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
Xylene, o	0.0005 U	0.001 U	0.001 U	0.001 U	0.001 U	
Xylenes (m&p)	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	

Table A-19
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-27/L-14C
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-27/L-14C OC-M27L14C 10/7/2008	M-27/L-14C OC-M27L14C 7/1/2010	M-27/L-14C OC-M27L14C 8/6/2010	M-27/L-14C OC-M27L14C 10/25/2010	M-27/L-14C OC-M27L14C 7/19/2011	M-27/L-14C OC-M27L14C 10/13/2011
Semivolatile Organics (mg/L)						
1,2,4,5-Tetrachlorobenzene		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
1-Methylnaphthalene		0.0048 U	0.000052 J	0.0045 U	0.0045 U	0.005 UJ
2,3,4,6-Tetrachlorophenol		0.0048 UJ	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
2,4,5-Trichlorophenol		0.0048 UJ	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
2,4,6-Trichlorophenol		0.0048 UJ	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
2,4-Dichlorophenol		0.0048 UJ	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
2,4-Dimethylphenol		0.0048 UJ	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
2,4-Dinitrophenol		0.0048 UJ	0.0049 U	0.0045 UJ	0.0045 UJ	0.005 UJ
2,4-Dinitrotoluene		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
2,6-Dinitrotoluene		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
2-Chloronaphthalene		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
2-Chlorophenol		0.0048 UJ	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
2-Methylnaphthalene		0.000095 U	0.000097 U	0.000091 U	0.000091 U	0.001 UJ
2-Methylphenol		0.0048 UJ	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
2-Nitroaniline		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
2-Nitrophenol		0.0048 UJ	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
3 & 4 Methylphenol		0.0048 UJ	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
3,3'-Dichlorobenzidine		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
3-Nitroaniline		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
4,6-Dinitro-2-methylphenol		0.0048 UJ	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
4-Bromophenyl phenyl ether		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
4-Chloro-3-methylphenol		0.0048 UJ	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
4-Chloroaniline		0.0048 UJ	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
4-Chlorophenyl phenyl ether		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
4-Nitroaniline		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
4-Nitrophenol		0.0048 UJ	0.0049 U	0.0045 UJ	0.0045 U	0.005 UJ
Acenaphthene		0.000095 U	0.000097 U	0.000091 U	0.000091 U	0.001 UJ
Acenaphthylene		0.000029 U	0.000029 U	0.000027 U	0.000027 U	0.0003 UJ
Acetophenone		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
Alachlor	0.00024 U					
Aniline		0.0048 UJ	0.0049 UJ	0.0045 UJ	0.0045 U	0.005 UJ
Anthracene		0.000095 U	0.000097 U	0.000091 U	0.000091 U	0.001 UJ
Atrazine	0.00024 U	0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
Azobenzene		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
Benzaldehyde		0.0048 U	0.0049 U	0.0045 UJ	0.0045 U	0.005 UJ
Benzo(a)anthracene		0.000029 U	0.000029 U	0.000027 U	0.000027 U	0.0003 UJ
Benzo(a)pyrene	0.00024 U	0.00019 U	0.00019 U	0.00018 U	0.00018 U	0.0002 UJ
Benzo(b)fluoranthene		0.000029 U	0.000029 U	0.000027 U	0.000027 U	0.0003 UJ
Benzo(ghi)perylene		0.000048 U	0.000049 U	0.000045 U	0.000045 UJ	0.0005 UJ

Table A-19
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-27/L-14C
Response Alternatives Evaluation Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-27/L-14C OC-M27L14C 10/7/2008	M-27/L-14C OC-M27L14C 7/1/2010	M-27/L-14C OC-M27L14C 8/6/2010	M-27/L-14C OC-M27L14C 10/25/2010	M-27/L-14C OC-M27L14C 7/19/2011	M-27/L-14C OC-M27L14C 10/13/2011
Benzo(k)fluoranthene		0.00029 U	0.00029 U	0.00027 U	0.00027 UJ	0.0003 UJ
Benzoic Acid		R	R	0.0045 UJ	0.0045 U	0.005 UJ
Benzyl alcohol		0.0095 U	0.0097 U	0.0091 U	0.0091 U	0.01 UJ
Biphenyl		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
Bis(2-Chloroethoxy)methane		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
Bis(2-Chloroethyl)ether		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
Bis(2-Chloroisopropyl)ether		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
Bis(2-Ethylhexyl)phthalate	0.0024 U	0.0019 U	0.0059 U	0.0023 U	0.0018 U	0.0015 J
Butylbenzylphthalate		0.0048 UJ	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
Caprolactam		0.0048 U	0.0049 UJ	0.0045 UJ	0.00094 J	0.005 UJ
Carbazole		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
Chrysene		0.00095 U	0.00097 U	0.00091 U	0.00091 U	0.001 UJ
Di-2-ethylhexyladipate	0.0018 U					
Dibenz(a,h)anthracene		0.00048 U	0.00049 U	0.00045 U	0.00045 UJ	0.0005 UJ
Dibenzofuran		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
Diethylphthalate		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
Dimethylphthalate		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
Di-n-butylphthalate		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
Di-n-octylphthalate		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
Diphenyl ether		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
Diphenylmethanone		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
Endrin	0.00061 U					
Fluoranthene		0.00095 U	0.00097 U	0.00091 U	0.00091 U	0.001 UJ
Fluorene		0.00095 UJ	0.00097 U	0.00091 U	0.00091 U	0.001 UJ
Gamma-BHC/Lindane	0.00024 U					
Heptachlor	0.00024 U					
Heptachlor epoxide	0.00024 UJ					
Hexachlorobenzene	0.00024 U	0.00095 U	0.00097 U	0.00091 U	0.00091 U	0.001 UJ
Hexachlorocyclopentadiene	0.0024 U	0.0048 UJ	0.0049 U	0.0045 U	0.0045 UJ	0.005 UJ
Hexachloroethane		0.0029 U	0.0029 U	0.0027 U	0.0027 U	0.003 UJ
Indeno(1,2,3-cd)pyrene		0.00048 U	0.00049 U	0.00045 U	0.00045 UJ	0.0005 UJ
Isophorone		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
Methoxychlor	0.00061 U					
Nitrobenzene		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
N-Nitrosodi-n-propylamine		0.0000095 U	0.000011 U	0.0000019 U	0.00000057 J	0.000002 U
N-Nitrosodiphenylamine		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ
Pentachlorophenol		0.00095 UJ	0.00097 U	0.00091 U	0.00091 U	0.001 UJ
Phenanthrene		0.00019 U	0.00019 U	0.00018 U	0.00018 U	0.0002 UJ
Phenol		0.0048 UJ	0.0049 UJ	0.0045 UJ	0.0045 U	0.005 UJ
Pyrene		0.0048 U	0.0049 U	0.0045 U	0.0045 U	0.005 UJ

Table A-19
Summary of Analytical Results in Residential Wells from 2008 through 2011 - M-27/L-14C
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Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	M-27/L-14C OC-M27L14C 10/7/2008	M-27/L-14C OC-M27L14C 7/1/2010	M-27/L-14C OC-M27L14C 8/6/2010	M-27/L-14C OC-M27L14C 10/25/2010	M-27/L-14C OC-M27L14C 7/19/2011	M-27/L-14C OC-M27L14C 10/13/2011
Simazine	0.00061 U					
NDMA (mg/L)						
N-Nitrosodimethylamine	0.000002 U	0.0000029	0.0000021 U	0.0000019 UJ	0.0000019 U	0.000002 U
Metals, Total (mg/L)						
Calcium	100	82	79	100	88.1	
Chromium	0.005 U	0.005 U	0.001 J	0.005 U	0.005 U	0.005 U
Sodium	26	23	25	23	24.8	25
Chromium, Hexavalent						0.001 UJ
Inorganics (mg/L)						
Chloride	100	110	92 J	100	98	100 J
Nitrate as N	0.054	0.064	0.05 U	0.15	0.05 U	0.31 J
Nitrite as N	0.01 U	0.1 U	0.1 U	0.01 U	0.01 U	0.01 UJ
Nitrogen, as Ammonia	0.1 U	0.1 U	0.1 U	0.17	0.1 U	0.1 UJ
Sulfate	38	36	41 J	43	36	46 J
Specialty Compounds (mg/L)						
Hydrazine		0.0002 UJ	0.0002 U	0.0001 U	0.0001 U	
Monomethylhydrazine (MMH)		0.0005 UJ	0.0005 U	0.0005 U	0.0005 U	
UDMH		0.0005 UJ	0.0005 U	0.0005 U	0.0005 U	
Acetaldehyde		0.03 U	0.03 U	0.03 U	0.03 U	
Formaldehyde		0.03 U	0.0051 J	0.03 U	0.03 U	
Phthalic Acid/Phthalic anhydride		0.01 UJ				

mg/L = milligram per liter

Prepared by / Date: KJC 03/27/12

Checked by / Date: BJR 03/29/12

U = not detected, value is the reporting limit

J = value is estimated

R = value is rejected